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Report upon the Nilamber Teak Plantations for the year 1878

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UPON TH

NELAMBUR TEAK PLANTATIONS.

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1878.

174

UPON THE

NELAMBUR TEAK PLANTATIONS.

Letter from Lieutenant-Colonel R. H. BEDDOME, Conservator of Forests, to C. G. MASTER, Esq., Secretary to Government, Revenue Department, dated Ootacamund, 20th April 1878, No. 104.

WITH reference to the Government Order, No. 2,846, of the 24th September last, I have the honor to inform you that I have lately paid a lengthened visit to Nelambur and been thoroughly over every year's plantation, critically examining the growth of the teak and the character of the soil, and taking measurements with a view to ascertain the probable yield at maturity, and going minutely into all particulars that are likely to be of value with reference to the future of these interesting teak plantations, and I now submit the report called for by Government.

2. I will commence my report by giving a brief extract from my field notes on each plantation, as these may be of much use to any one undertaking a critical report in future years, or to any Foresters casually visiting Nelambur and going over a few of the blocks.

3. In these notes I have given the average heights of the trees in each plantation and the average girths deduced from a considerable number of measurements. In taking measurements I always left out such saplings as were entirely overtopped and ought, in most cases, not to be standing; but even with this omission the average girths are not at all a criterion of the rate of growth of the ultimate crop, as in most of the plantations many hundreds of trees are still standing on each acre, but at 45 or 50 years of age there will only be sixty of the best of these on each acre; still these measurements are of much value and interest.

4. The following table gives the measurements and cubical contents of a sapling cut from each year's plantation, and from which specimens have been cut for the forthcoming Paris Exhibition. These, with the exception, perhaps, of the specimen from the 1847 Plantation, were not taken from the few large examples which have much outrun their neighbors, but are a fair average of the growth of the sixty trees per acre which will eventually be selected as to stand to maturity for the ultimate crop :—

44		1	10					.T.	INCH.	PA.	FEET.	IN.	PA
								72	11	4			
1845	...	2	10		50	12		60	...	...			
1846	D... ...	3	11		72	$11\frac{3}{4}$		69	...	4			
1847	Do. ...	4	105	105	70	$14\frac{1}{2}$		102	2	5			
1848	Do.	5	98	77	55	10		42	2	4			
1849	Do.	6	99	77	60	11		50	5	...	1	9	11
1850	Quartz and laterite ...	7	88	69	60	$8\frac{3}{4}$		31	4	9			
1851	Do. ...	8	81	62	51	$9\frac{1}{4}$		30	3	7			
1852	Laterite	9	71	69	54	$9\frac{1}{2}$		33	10	1			
1853	Do.	10	70	60	41	$8\frac{1}{2}$		21	9	7			
1854	Alluvial	11	110	69	70	11		52	9	10			
1855	Laterite	12	65	50	42	$7\frac{3}{4}$		17	6	2			
1856	Alluvial	13	77	62	53	$9\frac{1}{2}$		31	2	6			
1857	Laterite	14	81	52	50	$7\frac{1}{2}$		19	6	4			
1858	Alluvial	15	80	64	50	$7\frac{3}{4}$		20	10	3			
1859	Do.	16	72	58	44	$8\frac{1}{2}$		22	...	11	1	3	5
1860	Do.	17	75	60	40	$8\frac{1}{4}$		18	10	10			
1861	Do.	18	77	56	46	8		20	5	4			
1862	Do.	19	75	51	40	7		13	7	4			
1863	Do.	20	75	60	45	$8\frac{1}{4}$		21	3	8			
1864	Do.	21	75	60	56	$7\frac{3}{4}$		23	4	3			
1865	Do.	22	70	42	45	$6\frac{1}{2}$		13	2	5			
1866	Do.	23	75	56	52	$6\frac{3}{4}$		16	5	5			
1867	Do.	24	70	48	45	7		15	3	9			
1868	Do.	25	70	41	46	$6\frac{1}{4}$		12	5	8			
1869	Do.	26	65	33	32	$5\frac{1}{4}$		6	1	6	1	2	9
1870	Do.	27	56	32	44	$4\frac{3}{4}$		6	10	8			
1871	Do.	28	59	33	46	$4\frac{1}{4}$		5	2	2			
1872	Do.	29	50	24	35	$4\frac{1}{4}$		3	10	8			
1873	Do.	30	48	21	34	$3\frac{1}{2}$		2	5	11			
1874	Do.	31	34	$14\frac{1}{2}$	...	...		...	...	...			
1875	Do.	32	32	12	...	...		...	...	...			
1876	Do.	33	18	$9\frac{1}{2}$	...	...		...	...	...			

5. In the following notes, or critical examination of each plantation I have classed the soils as alluvial, gneiss, and laterite, and the anticipated yield per acre as Full, $\frac{4}{5}$ths, $\frac{3}{5}$ths, $\frac{2}{5}$ths, or Nil.

6. In all the more level or lower portions of the plantations the soil is alluvial and the growth splendid, and there can, I think, be no doubt as to the rapid development of the timber, and of the yield I have calculated on from all this portion, and it is all entered as Full.

7. That entered as $\frac{4}{5}$ths is chiefly gneiss or gneiss and alluvial and the growth here is almost as good as on the alluvial, and much of it will probably yield full crop though only entered at $\frac{4}{5}$ths; it may also be expected that the timber may be of better quality though probably of somewhat slower growth.

8. On most of the rising ground and hillocks about the plantations laterite crops up more or less, or there is a laterite bottom, or laterite and gneiss are mixed; those portions entered as $\frac{2}{5}$ths and $\frac{3}{5}$ths are where the laterite is more or less disintegrated and the growth now quite promising, though very much slower than on the alluvial and the foll of the trees very considerably shorter; it is much more difficult to form an opinion of the ultimate crop in these portions or to fix the age for maturity. The older portions of this class have taken a wonderful start

F CONSERVATOR OF
MUND, 20*th April* 1878.

From

LIEUT.-COL. R. H. BEDDOME,
Conservator of Forests,

To

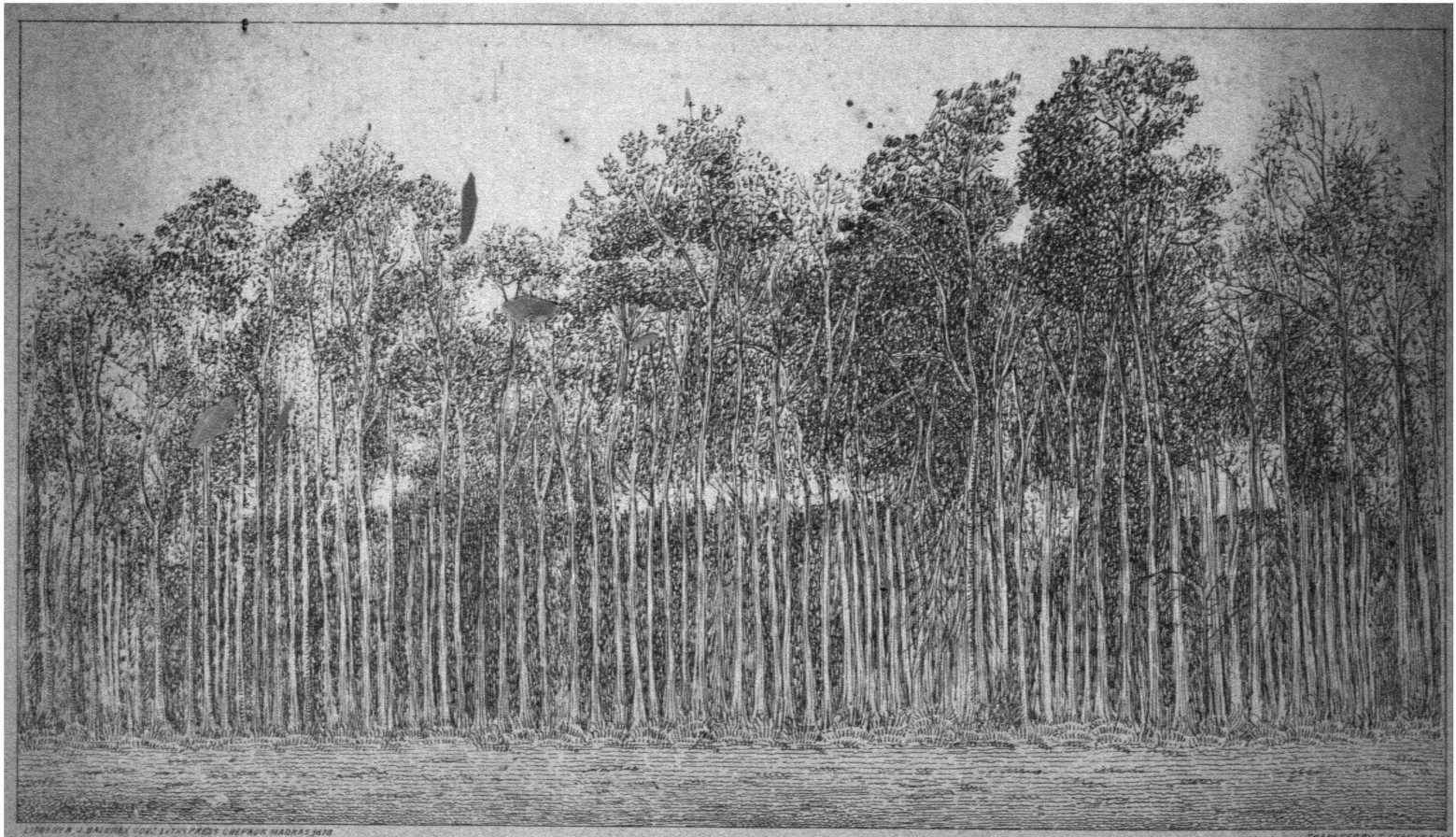
C. G. MASTER, ESQ.,
Secy. to Government, Revenue Department.

HAVE the honor to forward the accompanying critical report upon the nbur Teak Plantations required by Government for submission to the ernment of India and the Secretary of State. Being full of statistics that will f much value to this department, I would suggest that it should be printed in k form, and I should like to be allowed to correct the proof-sheets.

2. The specimens of teak saplings (alluded to in paragraph 86 of the report), which I am anxious should be forwarded to the Secretary of State, are now ready at my office in Ootacamund, and I request that you will inform me whether I should forward them to Madras to be packed there, or deliver them in your office in Ootacamund. They are in the rough, and I think it better that they should be polished after arriving in England. They are very interesting, and the rings shew clearly the age and annual development.

I have the honor to be,
Sir,
Your most obedient servant,

R. H. BEDDOME, Lieut.-Col.,
Conservator of Forests.



LITHO BY W. J. BALDERS, CONCLETON PRESS CHEPAUK MADRAS 1878

TRANSFERRED BY T. PRAGARASAM

Plantation 1844. IRUVELLICOVIL. *Scale 32' to 1"*

during the last 4 or 5 years, and I do not think I have over-estimated the yield. Further examination and alteration in the classification will here be necessary every 5 years or every decade as the growth advances, and in estimating the future yield I have only done the best I can with the data before me. It is possible that a large percentage of these trees may mature when of only small size, but Mr. Ferguson does not expect this, as he has cut very good indigenous teak on similar soils in the surrounding forest.

9. All those portions of the plantations in which the growth is very poor from the laterite being more or less impermeable I have entered as *Nil*, and I have treated in a similar way nearly all those parts where the soil is swampy (apparent in the dry weather from rank sedges taking the place of grass). I have had to include a very large area in this class, viz., 509 acres or more than one-seventh of the whole. It must not, however, be supposed that this area is bare; it is all more or less covered with trees but the growth very doubtful. On the tops and upper slopes of many of the hillocks where the laterite much predominates or is very impermeable, it is already quite evident that the trees can come to nothing, and in some places many are already dead or dying; but in this 509 acres there is much that might be classed at ¼th, only I have considered it best to be on the safe side and not too sanguine, and even in the poorer portions here and there trees will push through the laterite or overcome the moisture of the swampy soils and give fair timber.

10. The acreage of the plantations is by actual survey; the classification of the area according to the anticipated yield is only approximate, though I think nearly correct, as both Mr. Ferguson and I took great pains with it. When the plantations are thinned out to what is to stand for the ultimate crop (*i.e.*, 60 trees to the acre), we shall require large plans of each, with exact classification of areas and fullest particulars on all points, but such would be premature at present.

The Conservator's Notes on each Year's Plantation.

11. 1842 *Plantation*, area 30·93 acres. This was the first attempt at planting; it is a very irregular plantation compared to any of the others (as there was not a clean fell of the indigenous forest), and the planted teak is mixed with much indigenous teak of rambling growth and some jungle trees, but most of the latter have been felled out by Mr. Ferguson to give light and air to the planted teak. It is in two blocks on opposite sides of the Nelambur river near the palace; the soil near the river-bank is all alluvial and the growth fine, though for a long time it had suffered and been retarded for want of light and air; the rest of the plantation has laterite in the soil, but the growth is fair.

The girths at 6 feet from the base of three amongst the larger trees were as follows:—

Feet.	Inches.	Feet.	Inches.	Feet.	Inches.
5	1½	5	0	4	10

The average girth of the trees in the plantation, taken from a considerable number of measurements, is 2 feet 5½ inches; the average height is 80 feet.

	Acres.		
Classification of acreage	16	... =	Full.
	14·93	... =	⅘ths.

Three small mahogany seedlings (age one year) are growing very well here, and there is a promising though very young clump of the giant bamboo from Burma.

12. 1844 *Plantation*, area 62·93 acres. This is the first regular plantation: it is in three different blocks as follows:—

1*st Block* on the left bank of the Nelambur river near the palace, area 27·94 acres.

	Acres.	
Classification of acreage ...	70	= Full.
	20	= $\frac{4}{5}$ths.
	16 ...	= $\frac{3}{5}$ths.
	7	= $\frac{2}{5}$ths.
	5·53	= Nil.
	118·53	

16. 1848 *Plantation*, area 182·53 acres. In three blocks: the 1st block along the left bank of the Nelambur river, close to Nelambur; the 2nd block on the right bank of Kruruampoya; the 3rd block on the right bank of the Nelambur river, opposite the palace.

1*st Block*, *Ormacode*, area 84·34 acres.

40	acres alluvial	= Full.
12	do. with gneiss and a little laterite	= $\frac{4}{5}$ths.
10	do. laterite and gneiss, fairly good	= $\frac{3}{5}$ths.
16	do. similar, but indifferent	= $\frac{2}{5}$ths.
6·34	do. a hilly portion of laterite showing exceedingly poor growth	= Nil.

	Feet.	Inches.
Average height on alluvial with laterite	85	0
Do. girth on do. do.	3	$0\frac{1}{3}$
Do. height on laterite and quartz ...	45	0
Do. girth on do. do.	1	$11\frac{1}{3}$

2*nd Block*, *Yedacode*, area 82·15 acres.

46	acres alluvial	= Full.
14	do. gneiss, growth good	= $\frac{4}{5}$ths.
12	do. laterite, fair	= $\frac{3}{5}$ths.
10·15	do. poor laterite	= Nil.

	Feet.	Inches.
Average height on alluvial	85	0
Do. girth on do.	2	10

3*rd Block*, area 16·4 acres.

14 acres alluvial, first class	= Full.
2·4 acres	= $\frac{3}{5}$ths.

	Feet.	Inches.
Average height	90	0
Do girth	2	$6\frac{1}{5}$

	Acres.	
Classification of acreage ...	100	= Full.
	26	= $\frac{4}{5}$ths.
	24	= $\frac{3}{5}$ths.
	16	= $\frac{2}{5}$ths.
	16·53	= Nil.
	182·53	

17. 1849 *Plantation*, area 134·53 acres. In two blocks: the 1st block on the left bank of the Kruruampoya river; the 2nd block on the right bank of the same.

1*st Block*, 89·95 acres.

25	acres alluvial	= Full.
16	do.	= $\frac{4}{5}$ths.
25	do with laterite	= $\frac{3}{5}$ths.

A very poor knoll, adjoining the 1850 Plantation, about 4 acres, *Nil*; another very indifferent laterite hill, about 20 acres, *Nil*.

	Feet.	Inches.
Average height on alluvial	85	0
Do. girth on do.	2	$4\frac{7}{12}$

2nd Block, 14·58 acres.

30 acres alluvial, very good indeed	= Full.
4 acres	= ⅘ths.
10·58 acres alluvial with a little laterite	= ⅗ths.

	Feet.	Inches.
Average height on alluvial	90	0
Do. girth on do.	2	9¼

Classification of acreage ...	Acres.		
	55	... ...	= Full.
	20	... ...	= ⅘ths.
	25	... ...	= ⅗ths.
	11	... ...	= ⅖ths.
	23·53	... ...	= Nil.
	134·53		

18. 1850 *Plantation*, area 132·22 acres. In three blocks : the 1st block near the right bank of the Nelambur river opposite the palace ; the 2nd 2½ miles from Nelambur, separated from the right bank of Nelambur river by the 1846 Plantation ; 3rd block right bank of the same river, but separated from the river by a portion of 1846 Plantation and nearly opposite the palace.

1st Block, Ramalur, area 16·40 acres.
All alluvial and classed full. Measurements amongst the larger trees :—

Feet.	Inches.	Feet.	Inches.	Feet.	Inches.	Feet.	Inch.
3	8	4	0	3	10	4	1

	Feet.	Inches.
Average height	75	0
Do. girth	2	2½

2nd Block, Ellenjerry, area 66·15 acres.
A hilly and indifferent plantation.

16 acres chiefly gneiss	= Full.
10 acres laterite, fair	= ⅗ths.
40·15 acres laterite with very poor growth ...	= Nil.

	Feet.	Inches.
Average height on laterite ⅗th	50	0
Do. girth on the 26 acres . .	1	9¼

3rd Block, Yedacode, area 49·67 acres.
A very wretched plantation ; 14·60 acres alluvial with much laterite, equal to ⅗ths ; the rest Nil. All the centre of the plantation is a laterite hill which has quite gone out and is now covered with Irul (*Xylia*), this is about 25 acres ; and a laterite hill at the upper end, about 9 acres has also gone out, and a knoll adjoining 49 of about 1 or 2 acres is poor and apparently going out. Measurements of large trees on the 14·60 acres :—

Feet.	Inches.	Feet.	Inches.	Feet.	Inches.
3	4½	3	2	3	1

	Feet.	Inches.
Average height	70	0
Do. girth	1	10¾

Classification of acreage	Acres.		
	32	.. .	= Full.
	25	... ...	= ⅗ths.
	75·22	... ...	= Nil.
	132·22		

19. 1851 *Plantation*, area 147·19 acres. All in one block, partly on the right bank of the Kruruampoya.

	Acres.		
Classification of acreage ...	55	alluvial	= Full.
	25	... ...	= ⅞ths
	15	laterite fair ...	= ⅝ths.
	15	do. indifferent	= ⅜ths.
	37·19	do. bad ..	= Nil.
	147·19		

Measurements amongst the larger trees on the 55 acres :—

Feet.	Inches.	Feet.	Inches.	Feet.	Inches.	Feet.	Inches.
5	2	5	0	4	6	4	8

	Feet.	Inches.
Average height	80	0
Do. girth ...	2	$7\frac{5}{12}$
Do. height on 15 acres ⅜ths	60	0
Do. girth on do.	2	$2\frac{1}{8}$

20. 1852 *Plantation*, area 38·57 acres. All in one block between the palace and Nelambur river.

	Acres.		
Classification of acreage	20	alluvial	= Full.
	10	laterite bottom	= ⅞ths.
	5	do.	= ⅜ths.
	3·57	do. ...	= Nil.
	38·57		

	Feet.	Inches.
Average height on the 20 acres alluvial	75	0
Do. girth on do. do. ...	2	$1\frac{1}{4}$
Do. height on the 10 acres ⅞ths ...	50	0
Do. girth on do. do.	1	$9\frac{1}{12}$

21. 1853 *Plantation*, area 55·60. In two blocks, 1st on the left bank of Nelambur river, 2nd on right bank.

1*st Block*, area 34·89 acres.
A fair plantation, mostly alluvial.

18 acres alluvial ... ... ; ...	=	Full.
10 acres ... ... :	=	⅞ths
6·89 acres indifferent	=	⅜ths.

	Feet.	Inches.
Average height on alluvial	65	0
Do. girth	2	$3\frac{1}{2}$

2*nd Block*, area 20·71 acres.

6 acres alluvial	=	Full.
9 acres	=	⅞ths.
5 71 acres	=	Nil.

This is divided by a paddy-field into two portions, the 1st portion being 12·93 acres; on the best part of this the average height was 55 feet and the average girth 1 foot $10\frac{2}{3}$ inches, and measurements amongst the larger trees gave 2 feet $9\frac{1}{2}$ inches, 2 feet 9 inches, 2 feet 8 inches. On the poorer part the average height was 45 feet and the average girth 1 foot $5\frac{1}{4}$ inches.

The 2nd portion beyond the paddy-field, area 7·78 acres, alluvial but indifferent, growth will probably be good; but at present backward from the shade of

indigenous teak trees that were left standing, these have lately been cleared away and the growth is improving.

	Acres.		
Classification of acreage ...	24	alluvial	= Full.
	10	do.	= ⅘ths.
	9	indifferent ...	= ½ths.
	6·89	do.	= ⅖ths.
	5·71	do.	= Nil.
	55·60		

22. 1854 *Plantation, Panyangote Block*, area 92·33 acres. All in one block on the Nelambur river to the east of Nelambur.

	Acres.		
Classification of acreage ...	60	alluvial, very good	= Full.
	15	do. and gneiss	= ⅘ths.
	10	gneiss and laterite	= ⅗ths.
	7·33	laterite, poor ...	= ⅕ths.
	92·33		

Measurements amongst the larger trees on the 60 acres alluvial:—

Feet.	Inches.	Feet.	Inches.	Feet.	Inches.	Feet.	Inches.
4	5	4	2½	4	4	3	0
3	8½	3	10	*4	0½	...	...
3	8½	3	11	3	7	...	..
3	3	4	6½	3	1	...	..

This alluvial portion shows splendid growth. Many of the trees are 100 feet high; the tree that measured* 4 feet 0½ inch in girth had a boll 80 in height and contained at least 80 cubic feet.

	Feet.	Inches.
Average girth of trees	2	1½

23. 1855 *Plantation, Panyangote Block*, area 100·32 acres. All in one block between the high road and the Plantation of 1854.

	Acres.		
Classification of acreage ...	30	alluvial with laterite	= ⅗ths.
	10	do. do.	= ⅖ths.
	60·32	very poor laterite	= Nil.
	100·32		

A very poor plantation. Measurements amongst the larger trees on the 40 acres:—

Feet.	Inches.	Feet.	Inches.	Feet.	Inches.
2	5½	2	9½	2	5½

	Feet.	Inches.
Average girth	1	7½

24. 1856 *Plantation, Panyangote Block*, area 79·26 acres. All in one block on the left bank of the Nelambur river adjoining the Plantations of 1854 and 1855.

	Acres.		
Classification of acreage ...	40	alluvial	= Full.
	16	gneiss	= ⅘ths.
	15	laterite	= ⅗ths.
	8·26	do.	= Nil.
	79·26		

Measurements amongst the larger trees on the 40 acres :—

Feet.	Inches.	Feet.	Inches.	Feet.	Inches.	Feet.	Inches.
3	8	3	2½	3	8½	3	8½

	Feet.	Inches.
Average height on alluvial	85	0
Do. girth on do.	1	10½

25. 1857 *Plantation, Nelambur Block*, area 36·14 acres. All in one block on the right bank of the Nelambur river, 3 miles west of Nelambur.

	Acres.		
Classification of acreage ...	8	alluvial, good ...	= Full.
	24	gneiss and laterite	= ¾ths.
	4·14	laterite	= Nil.
	36·14		

	Feet.	Inches.
Average height on 8 acres alluvial	70	0
Do. girth on do. do. ...	2	0 4/12
Do. height on 24 acres	50	0
Do. girth on do. do. ...	1	9 1/12

26. 1858 *Plantation*, area 42·79 acres. All in one block in Nelambur on the left bank of the Kruruampoya.

	Acres.		
Classification of acreage ...	20	alluvial	= Full.
	12	gneiss and laterite	= ¾ths.
	8	do. do. ...	= ⅜ths.
	2·79	laterite ...	= Nil.
	42·79		

Measurements amongst the larger girths :—

Feet.	Inches.	Feet.	Inches.	Feet.	Inches.
3	8½	2	8	3	7½
2	1	3	5½	2	5½

	Feet.	Inches.
Average height on alluvial	65	0
Do. girth on do.	2	2
Greatest height	80	0

27. 1859 *Plantation*, area 39·84 acres. All in one block adjoining the 1858 Plantation, on the left bank of the Kruruampoya.

	Acres.		
Classification of acreage ...	25	alluvial	= Full.
	12	laterite	= ½ths.
	2·84	do.	= Nil.
	39·84		

Measurements amongst the girths of larger trees on the alluvial :—

Feet.	Inches.	Feet.	Inches.	Feet.	Inches.	Feet.	Inches.
3	6	3	3	2	5	2	8½

	Feet.	Inches.
Average height on alluvial	65	0
Greatest do. do.	77	0
Average girth do.	2	1

Measurements amongst the larger girths on the 12 acres laterite :—

Feet.	Inches.	Feet.	Inches.	Feet.	Inches.
2	3½	2	4½	2	1½

	Feet.	Inches.
Average height on the same...	40	0
Do. girth do.	0	10

28. 1860 *Plantation*, area 39·56 acres. All in one block on the right bank of the Kruruampoya.

	Acres.		
Classification of acreage ...	20	alluvial, good ...	= Full.
	8	laterite, indifferent	= ¾ths.
	5	do poor	= ⅔ths.
	6·56	do. ...	= Nil.
	39·56		

Measurements amongst the larger trees :—

Feet.	Inches.	Feet.	Inches.	Feet.	Inches.	Feet.	Inches.	Feet.	Inches.
3	2	2	10½	2	8	2	10	2	6½

	Feet.	Inches.
Average height on alluvial	65	0
Greatest do. do.	80	0
Average girth do.	2	0½
Do. height on laterite	30	0
Do. girth do.	0	10

The laterite portion is inferior, but will probably improve.

29. 1861 *Plantation*, area 86·5 acres. All in one block adjoining 1860, on the right bank of the Kruruampoya.

	Acres.		
Classification of acreage ...	30	alluvial	= Full.
	37	laterite	= ¾ths.
	8	hilly laterite ...	= ⅔ths.
	11·5	hilly	= Nil.
	86·5		

Measurements amongst the larger trees on alluvial :—

Feet.	Inches.	Feet.	Inches.	Feet.	Inch.	Feet.	Inches.
3	4½	3	2	3	1	2	9

	Feet.	Inches.
Average height on alluvial	65	0
Greatest do. do.	77	0
Average girth do.	2	2
Do. do. on laterite	1	2
Do. height do.	50	0

30. 1862 *Plantation*, area 50·11 acres. All in one block on the Kruruampoya, adjoining 1861.

	Acres.		
Classification of acreage ...	30	alluvial	= Full.
	10	gneiss	= ¾ths.
	6	do. and laterite ...	= ⅔ths.
	4·11	laterite	= Nil.
	50·11		

Measurements of the girths of some of the larger trees on the 30 acres :—

Feet.	Inches.	Feet.	Inches.	Feet.	Inches.
3	6	3	1	3	1½
2	8	2	4	...	..

	Feet.	Inches.
Average girth of trees on alluvial	2	2
Do. height do.	65	0
Greatest do. do.	75	0

There are a great many overtopped trees in this plantation and thinning is very necessary.

31. 1863 *Plantation, Panyangote Block*, area 81·25 acres. All in one block east of Nelambur on left bank of Nelambur river, adjoining the 1856 Plantation.

	Acres.		
Classification of acreage .	55	alluvial	= Full.
	15	gneiss	= ¼ths.
	8	do. and laterite .	= ⅔ths.
	3·25	laterite	= Nil.
	81·25		

Measurements of girths amongst the larger trees :—

Feet.	Inches.	Feet.	Inches.	Feet.	Inches.
2	6	2	7	3	1
2	7	2	10	3	1½
2	10	3	1	...	...

	Feet.	Inch.
Average height on alluvial	75	0
Do. girth on do.	1	8¾

32. 1864 *Plantation*, area 121·71 acres. In two blocks, separated by the Karapoya river on the high road to the east of Nelambur.

1*st Block*, area 81·14 acres, on the right bank of the Karapoya in Waluvaisheri.

45 acres alluvial	= Full.
11 do. do. with some laterite	= ¼ths.
9 do. laterite	= ⅔ths.
3 do. do.	= ¾ths.
13·14 acres swampy and gone out	= Nil.

The growth here is quite similar to the next block.

2*nd Block*, area 40·57 acres, on the left bank of the Karapoya in Panyangote.

25 acres alluvial	= Full
5 do.	= ¼ths.
3 do. laterite	= ⅔ths.
5 do. where laterite predominates	= ¾ths.
2·57 acres laterite	= Nil.

Measurements among the larger trees :—

Feet.	Inches.	Feet.	Inches.	Feet.	Inches.
2	6½	2	11	3	4
2	6	3	1	3	5

	Feet.	Inches.
Average height on alluvial	70	0
Do. girth on do.	1	8½

	Acres.		
Classification of acreage ..	70	alluvial	= Full.
	16	do. with laterite	= ¼ths.
	12	laterite	= ⅔ths.
	8	do.	= ¾ths.
	15·71	swamp or laterite...	= Nil.
	121·71		

33. 1865 *Plantation*, area 56·63 acres. All in one block on the right bank of the Karapoya, only separated from Block No. 1 of 1864 by the high road to Wynad.

	Acres.		
Classification of acreage ..	35 alluvial	...	= Full.
	16 laterite	... ...	= ¾ths.
	5·63 do.	... ...	= ⅔ths
	56·63		

Measurements of the girths amongst the larger trees :—

Feet.	Inches.	Feet.	Inches.	Feet.	Inches.
2	7½	2	5	2	5

	Feet.	Inches.
Average height on alluvial	65	0
Do. girth on do.	1	6⅚

In the centre of the plantation there is a very fine blackwood tree, a self-seedling. In 1865, when the site was planted, Mr. Ferguson informs me, it was a fine straight sapling but not above 3 feet in girth; it is now (February 1878) 5 feet 10 inches in girth at 6 feet up the trunk and has a clean straight boll of about 80 feet. This tree will be kept standing to test the rate of growth.

34. 1866 *Plantation*, area 128·64 acres. In two blocks on the right bank of the Karapoya in Waluvaishori, separated by a block of 1869.

No. 1, *Northern Block*, area 96·34 acres.

46 acres alluvial or alluvial and gneiss	= Full.
12 do. gneiss	= ¾ths.
16 do. gneiss and laterite	= ½ths.
12 do. laterite	= ⅔ths.
10·34 acres laterite	= Nil.

Measurements amongst the larger girths :—

Feet.	Inches.	Feet.	Inches.	Feet.	Inches
2	4½	2	7½	2	5½
2	9½	2	10	...	...

	Feet.	Inches.
Average height on alluvial and gneiss ...	65	0
Do. girth on do. ...	1	4½

No. 2, *Southern Block*, area 32·30 acres.

30 acres alluvial or alluvial and gneiss	= Full.
2·30 do. laterite	= Nil.

Girths amongst the larger trees :—

Feet.	Inches.	Feet.	Inches.
3	1½	2	10½

Growth quite similar to No. 1 Block.

	Acres.		
Classification of acreage ...	76 alluvial or alluvial and gneiss ..	...	= Full.
	12 gneiss	...	= ¾ths.
	16 do. and laterite		= ½ths.
	12 laterite ...		= ⅔ths.
	12·64 laterite ...	. .	= Nil.
	128·64		

35. 1867 *Plantation*, area 118·63 acres. In two blocks in Waluvaishori, the first on the left bank of the Shurliar between blocks of 1866 and 1868, the 2nd block a little to the south-east of the first.

1*st Block*, area 41·31 acres.

39 acres alluvial	=	Full.
2·31 acres laterite	=	Nil.

Measurements amongst the larger girths :—

Feet.	Inches.	Feet.	Inches.
2	4½	2	10
2	5	2	10½
2	7	2	7

	Feet.	Inches.
Average height on alluvial	65	0
Do. girth on do.	1	6¼

2*nd Block*, area 77·32 acres.

41 acres alluvial or alluvial and gneiss	=	Full.
9 do. gneiss	=	⅘ths.
12 do. laterite and gneiss	=	⅗ths.
10 do. hilly and laterite	=	⅖ths.
5·32 acres hilly and laterite, very poor	=	Nil.

Growth similar to No. 1 Block.

	Acres.		
Classification of acreage .	80 alluvial or alluvial and gneiss ...	=	Full.
	9 gneiss ..	=	⅘ths.
	12 laterite and gneiss ...	=	⅗ths.
	10 laterite hilly ...	=	⅖ths.
	7·63 laterite ...	=	Nil.
	118·63		

36. 1868 *Plantation*, area 145·40 acres. In three blocks in Waluvaisheri, the 1st block north of the road leading to Wynad from Nelambur, the 2nd block north-east of the 1st on left bank of Shurliar, and the 3rd block north of the 2nd on the same bank of the same river.

1*st Block*, area 32·38 acres.

18 acres alluvial	=	Full.
4 do. alluvial and laterite	=	⅘ths.
3 do. rather hilly and laterite	=	⅗ths.
3 do. hilly with laterite	=	⅖ths.
4·38 acres hilly laterite bottom and very poor growth ...	=	Nil.

	Inches.
Average girth on the 22 acres	11½

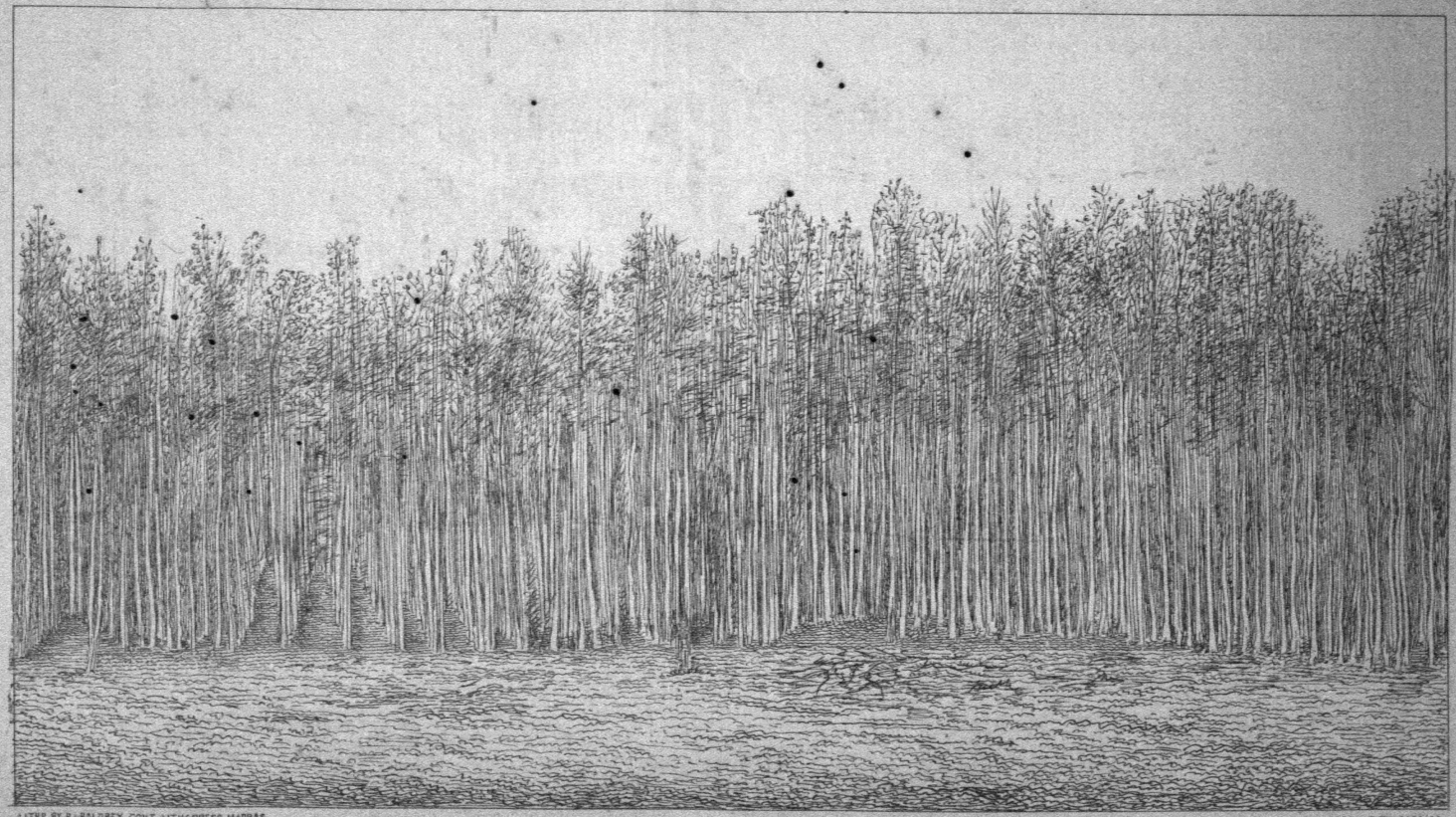
2*nd Block*, area 79·8 acre. A wonderfully good plantation.

35·6 acres alluvial	=	Full.
16 do. with laterite mixed	=	⅘ths.
13 do. the same	=	⅗ths.
7 do. laterite predominating	=	⅖ths.
8·2 do. very poor laterite	=	Nil.

Measurements amongst the larger girths :—

Feet.	Inches.	Feet.	Inches.	Feet.	Inches.
2	4½	2	1½	1	9½
2	3½	1	11	.	...

	Feet.	Inches.
Average height on the 51·6 acres	60	0
Do. girth on do.	1	0½



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TRANSFER BY T. THAGARAJOO

Plantation 1868 WALAVAISHARY — *Scale 20 to 1.*

Inside but near the edge of this plantation, I came upon some well-grown natural teak trees; one had a splendid straight boll of 75 feet in length and a girth (at 6 feet from the base) of 6 feet, another had a girth of 7 feet 6 inches, and a third a girth of 7 feet 9½ inches with a boll which was forked at about 40 feet from the ground (from injury when young), but the girth very equal and scarcely tapering at all. Mr. Ferguson assured me that the largest of these trees was not over 4 feet in girth when he planted the site, but that they were very much shut out from light and air at that time by large jungle trees, and that the growth since he had felled for opening the plantation had been watched by him as he had been attracted by its wonderful rapidity. I had the tree of the largest girth felled to ascertain its age, and will allude to it further on.

3rd Block, area 33·94 acres.

All alluvial and first-class, and exhibiting, I think, the most wonderful growth for its age of anything in the Conolly plantations. Large trees very numerous.

Measurements amongst the larger girths—

Feet.	Inches.	Feet.	Inches.	Feet.	Inches.
2	2	2	6	2	8
2	0	2	6	2	8
2	3	2	6½	3	0

	Feet.	Inches.
Average height	65	0
Do. girth	1	8

On a few acres of this dry paddy was put down as an experiment with the crop of teak; no profit resulted as the grain was destroyed by various enemies, and the only result was a check to the early growth of the young teak saplings from too much shade.

	Acres.		
Classification of acreage ...	87	alluvial	= Full.
	20	do. with laterite	= ¼ths.
	16	laterite	= ½ths.
	10	do. ...	= ¾ths.
	12·40	laterite	= Nil.
	145·40		

37. 1869 *Plantation*, area 53·56 acres. In two blocks in Waluvaisheri, the 1st block on the Shurliar, east of No. 2 Block of 1868, 2nd block on right bank of the Karapoya between two blocks of the 1866 Plantation.

1st Block, area 39·36 acres.

16 acres alluvial	= Full.
12 do. alluvial with a mixture of laterite	= ¼ths.
7 do rather hilly and with laterite	= ½ths.
4·36 do. laterite hill, the teak gone out and since planted with blackwood (*Dalbergia latifolia*) which is growing	= Nil.

This plantation shows very rapid growth, and there are many prominently large trees.

Measurements amongst the larger girths all well within the plantation:—

Feet.	Inches.	Feet.	Inches.	Feet.	Inches.	Feet	Inches.
1	10½	2	1	2	6½	2	2¾
2	6½	1	10	2	0½		. .

	Feet.	Inches.
Average height on the 28 acres	60	0
Do. girth on do.	1	2¼

2nd Block, area 14·20.

All alluvial and classed full growth; not quite equal to the best portion of the No. 1 Block.

	Acres.	
Classification of acreage ...	30 alluvial	= Full.
	12 do. with laterite ...	= ⅘ths.
	7 hilly and laterite ...	= ⅗ths.
	4·56 do. do. ...	= Nil.
	53·56	

38. 1870 *Plantation*, area 74·23 acres. This is in the Nellicootah Block, which is much nearer the base of the hills than Nelambur, the soil and forest growth are much finer than anything at Nelambur, the former is more like that of our best hill forests, such as the Anamallays, with a considerable mixture of gneiss and little or no laterite. Shortly after this was opened and the soil disturbed the locality proved exceedingly feverish; planting was, however, persevered in for 2 years, but the whole of the Nelambur establishment became quite disorganized, and Mr. Ferguson suffered so in health that he was finally obliged to seek a change to Scotland.

Wild elephants have the run of these Nellicootah plantations, and do very great damage. Besides the injury from elephants, deer, &c., it has been impossible to attempt to keep them clear of the rank growth of shrubs, weeds, and creepers, or to attend to pruning, both so important with reference to the admission of sufficient light and air. Fire has however been kept out, and notwithstanding the disadvantages, I believe we shall eventually see some finer growth here than anywhere else in Nelambur, and probably timber of a better quality.

A general weeding took place in 1872 and again in July 1876, but this and the next plantation have not been touched since, and there is now a rank growth of shrubs (chiefly *Desmodium cephalotes* and *Helicteres isora*) 6 to 10 feet high, weeds, grass and creepers, which must retard the growth of the young teak, but the teak trees, when they grow up, will in time keep this down.

	Acres.	
Classification of acreage ...	25 gneiss hill with alluvial, growth very good ...	= Full.
	25 alluvial flat along river bank	= Do.
	12 alluvial and some laterite	= ⅘ths.
	8 damp ground	= ⅗ths.
	4·23 swampy	= Nil.
	74 23	

The 25 acres alluvial on the river bank shows splendid growth, but unless arrangements be made to catch or drive away the wild elephants it will have to be classed as ⅗ths instead of Full, as Mr. Ferguson estimates the damage of late at about 40 per cent., and it is increasing and the animals becoming very impudent and troublesome.

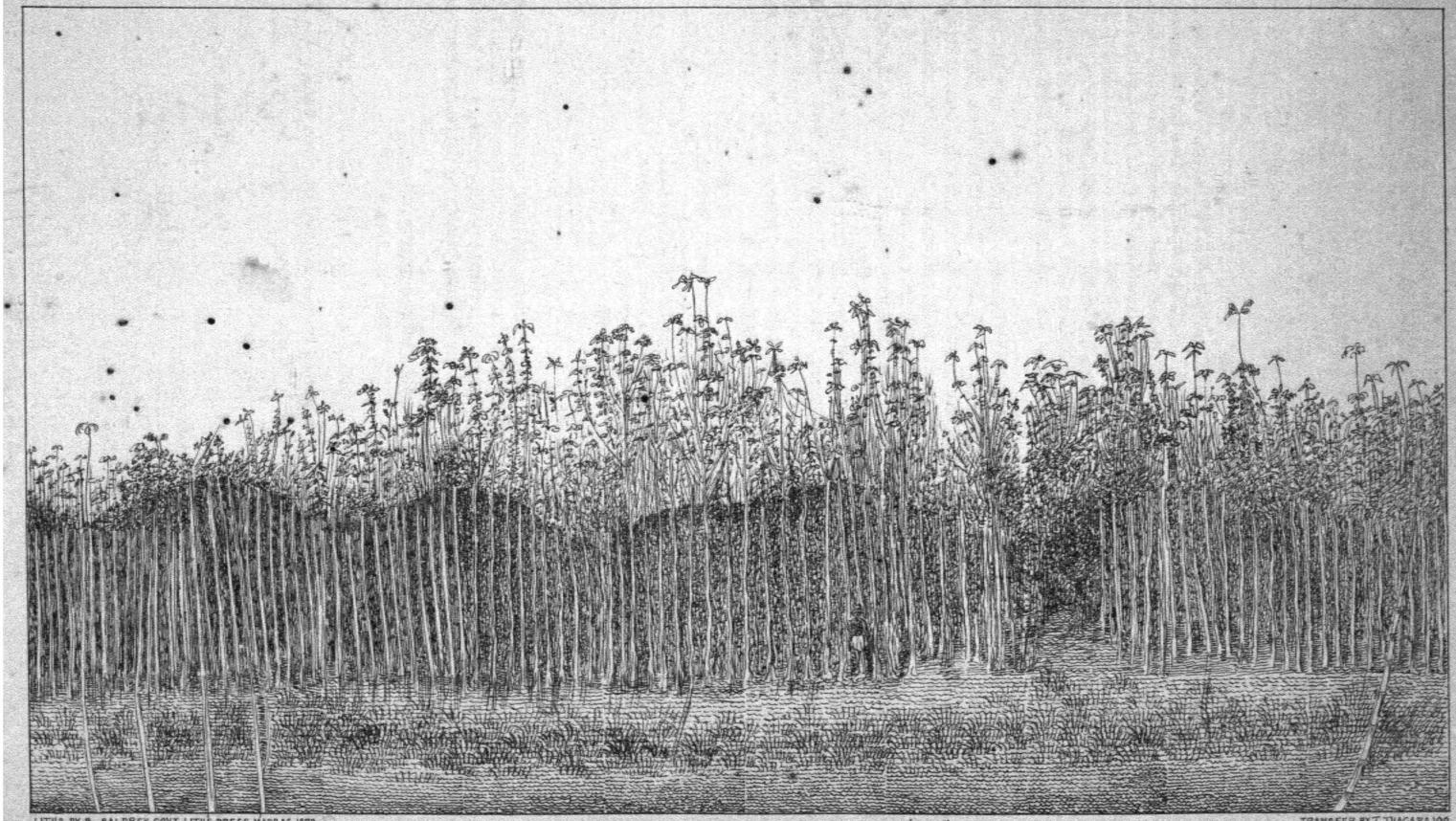
Measurements amongst the larger girths on the gneiss hill :—

Feet	Inches.	Feet.	Inches.
1	10½	1	11½
1	10½	2	2½

Measurements amongst the larger girths on the alluvial of river bank :—

Feet.	Inches.	Feet.	Inches.	Feet.	Inches.	Feet.	Inches.
1	10	2	2	2	6	1	10
2	2½	2	1	1	11½		...

	Feet.	Inches.
Average girths on alluvial	1	1 1/6
Do. do. on gneiss hill	1	0 7/8
Do. height	40	0
Greatest do.	57	0



LITHO. BY R. BALDREY GOVT. LITHO. PRESS MADRAS 1878

Plantation 1873 **AMRAPOLLIAM** *Scale 15' to 1"*

TRANSFER BY T. THAGARAJOO

39. 1871 *Plantation*, not surveyed, area (approximate) 46 acres at Nellicootah. The remarks under the 1870 Plantation apply equally to this.

This is an exceedingly good plantation, the growth has a sturdier look than anything at Nelambur, but there is much damage from wild elephants, which is on the increase

	Acres		
Classification of acreage ...	36 alluvial	.. ..	= Full.
	10 swampy soil	...	= Nil.
	46		

The swampy soil has been put down *Nil*, but many trees will probably overcome the damp.

Measurements amongst the larger girths :—

Feet	Inches	Feet	Inches	Feet.	Inches.
1	8½	1	11½	1	7
1	11	1	8½	2	1½

	Feet.	Inches.
Average height	40	0
Greatest do.	55	0
Average girth	1	3 $\frac{8}{15}$

40. 1872 *Plantation*, area 207·56 acres. All in one block in Chetamborai

	Acres.	
Classification of acreage	110 alluvial	= Full.
	30 do. with some gneiss	= ⅘ths.
	25 do. with gneiss and laterite ...	= ⅗ths.
	12 soil too damp but trees now making a start	= ⅖ths.
	30 56 swampy	= Nil.
	207·56	

Measurements amongst the larger girths on the 110 acres :—

Feet	Inches	Feet.	Inches
2	1½	1	9½
1	9	1	8½
1	6½		

	Feet.	Inches.
Average height on alluvial	42	0
Do girth do	1	1½
Do height on the 25 acres ⅗ths ...	20	0

41. 1873 *Plantation*, area 141·47 acres. In two blocks, 1st block is Chetamborai adjoining the 1872 Plantation ; 2nd block at Amrapolliam.

1st Block, Chetamborai, area 99·8 acres:

45 acres alluvial	= Full
20 do do and gneiss	= ⅘ths
15 do. gneiss and laterite	= ⅗ths
10 do laterite poor	= ⅖ths.
9·8 acres swampy	= Nil.

Measurements amongst larger girths on the 65 acres :—

Feet.	Inches.	Feet.	Inches.	Feet.	Inches.
1	4½	1	4	1	6
1	7½	1	4	1	6½

	Feet.	Inches.
Average height on the same	30	0
Do. girth on do ...	0	10½

There is a fine young mahogany tree in this plantation, growing splendidly amongst the teak; it is 30 feet high, girth at the base 1 foot 5½ inches, and at 6 feet high 1 foot 1½ inches.

2nd Block, Amrapolliam, area 42·39 acres. On the right bank of the Cherapoya.

33	acres alluvial	= Full.
9·39	do. more or less swampy .	= Nil; though trees here and there are showing growth.

Measurements amongst the larger girths :—

Feet.	Inches.	Feet.	Inches.
1	0½	1	3
1	3½	1	0
1	3½		

	Feet.	Inches.
Average height	22	0
Greatest do.	33	0

	Acres.	
Classification of acreage ..	78 alluvial	= Full.
	20 do. and gneiss	= ⅘ths.
	15 gneiss and laterite	= ⅗ths.
	10 laterite, poor ...	= ⅖ths.
	18·47 swampy ..	= Nil.
	141·47	

42. 1874 *Pantation*, area 160·49 acres. In two blocks, 1st block in Chetamborai adjoining the 1873 Plantation; 2nd block at Amrapolliam.

1st Block, Chetamborai, area 91·46 acres.

45 acres alluvial	= Full.
10 do. do. with some laterite	= ⅘ths.
10 do. laterite, mixed	= ⅗ths.
10 do. do.	= ⅖ths.
10 do. do.	= Nil.
6·46 acres swampy	= Nil.

Measurements amongst larger girths on the alluvial :—

Foot.	Inches.	Foot.	Inches.
1	1½	1	2½

	Feet.	Inches.
Average height on alluvial	25	0
Do. girth on do.	0	8½

2nd Block, Amrapolliam, area 69·3 acres.

30 acres alluvial	= Full.
5 do. do. and laterite	= ⅘ths.
15 do. do. do.	= ⅗ths.
10 do. laterite, poor	= ⅖ths.
9·3 do. do. very poor	= Nil.

Measurements amongst the larger girths :—

Feet.	Inches.	Feet.	Inches.
1	2½	0	10½
1	0½	0	10½
0	10½	0	10½

	Feet.
Average height	18
Greatest do.	30

	Acres		
Classification of acreage	75	alluvial ...	= Full.
	15	do. and laterite	= ¼ths.
	25	do do.	= ½ths
	20	laterite	= ¾ths
	25 49	do very poor or swampy	= Nil.
	160·49		

43. 1875 *Plantation*, area 160·91 acres. In two blocks, 1st block in Chetamboraï adjoining the 1874 block; the 2nd block in Amrapolliam.

1*st Block*, *Chetamboraï* (not surveyed), area approximate 100 acres.

40 acres alluvial	= Full.
10 do. do with some laterite and gneiss . .	= ¼ths.
7 do. laterite	= ½ths.
13 do do.	= ¾ths.
30 acres, very indifferent, laterite ...	= Nil.

Measurements, amongst the larger girths :—

Foot.	Inches	Foot.	Inches	Foot	Inches
1	1½	1	2	1	0½

	Feet.	Inches.
Average height on alluvial .	25	0
Do girth	0	7¼

2*nd Block*, *Amrapolliam*, area 60·91 acres. On the right bank of Kudrapoya.

33 acres alluvial	= Full.
5 do. hilly gneiss	= ¼ths
8 do. do. laterite ...	= ½ths
4 do do. gneiss and laterite	= ¾ths.
10 91 acres hilly laterite ...	= Nil.

Measurements amongst the larger girths :—

Foot	Inch	Foot	Inches	Foot	Inches	Foot	Inches
1	0	0	11½	0	11	0	11

	Feet
Average height on alluvial ...	10
Greatest do. do	24

	Acres.		
Classification of acreage ...	73	alluvial	= Full.
	15	do and gneiss ..	= ¼ths
	15	do and laterite ...	= ½ths
	17·10	laterite	= ¾ths.
	39	laterite ...	= Nil.
	160 91		

44. 1876 *Plantation*, area (not surveyed) 149 acres. In three blocks at Amrapolliam; 1st block on the right bank of Kudrapoya, 2nd block separated from No. 1, by paddy-fields, 3rd block on left bank of Cherapoya.

1*st Block* about 35 acres alluvial, the rest two laterite hills. Classed as follows rather with respect to the probable future growth than with reference to anything on it at present:—

35 acres alluvial	= Full.
10 do laterite	= ¼ths.
5 do do	= ½ths.
20 do. do.	= Nil

The jungle and forest on the whole of the site was felled and burnt in 1874 and not planted till 1876 owing to a want of plants; this has never occurred elsewhere, and only happened owing to a change at the time in the officers in charge. A rank growth sprang up between the burn and the plant, and this took so much out of the surface soil that the young seedlings would not grow properly; (it is just the same with coffee if there be a delay in planting after the burn and weeds be allowed to grow). 1876 was also a very poor monsoon; this block is therefore a wretched failure at present, but Mr. Ferguson is going to replant all casualties.

2nd Block, 20 acres. A poor laterite hill, and present condition the same as No. 1 Block.

5 acres	.. . .	... = ¾ths
15 do.	... ...	... = Nil.

3rd Block, 59 acres. The growth is fair and often good in this block, but many hundreds of the young seedlings have been attacked (in a way never known to anything like the extent before) by a destructive borer, and they will have to be cut bodily down and spring again from the root.

35 acres alluvial	... ...	= Full.
10 do do. ...	.. ...	= ¾ths.
10 do. do. ...	.. ...	= ½ths.
4 do. do.	.. ...	... = Nil.

Classification of acreage	Acres		
	70	...	... = Full
	25	...	= ¾ths.
	15	.. ..	= ½ths.
	39	... ...	. = Nil.
	149		

45. *Purchased Plantation*, area 87·44 acres. This is at Amrapolliam on the Cherrapoya, and was purchased for 10,000 Rupees.

About 62 acres were planted apparently about the year 1861 and the rest probably in 1869.

The alluvial portion of the older planting is very good, and there are many prominently large trees. Measurements amongst the larger trees on the outskirts of plantation :—

Feet	Inches.	Feet	Inches.	Feet.	Inches
3	1½	3	0½	2	7½

Inside the plantation :—

Feet.	Inches	Feet.	Inches	Feet.	Inches	Feet	Inches.
2	7	3	4½	3	2	3	3½

	Feet
Average height on alluvial	70
Greatest height on do	80

The laterite hilly portion is much inferior to the alluvial

Measurements amongst the larger girths on the outskirts of the plantation :—

Feet	Inches.	Feet	Inches.
2	3	2	10
1	10½	2	7
1	9	2	0½
2	2		

Within the plantation :—

Feet	Inches.	Feet.	Inches	Feet	Inches.
1	8	1	7½	1	8
1	8	1	7		

	Feet.
Average height	35
Greatest do	65

In the younger or 1869 portion there are many jungle indigenous trees mixed with the planted teak.

	Feet.
Average height	50

Measurements of large girths :—

Feet.	Inches.	Feet.	Inches.
2	0½	2	0
1	11	1	10½

Classification of acreage

Acres.			
60	alluvial	=	Full.
22	laterite hilly	=	¾ths.
5·44	do	=	Nil.
87·44			

46. In addition to the above plantations, there are a few small tracts of natural teak supplemented by planting within the Trikalayur Pagoda land which were planted about the year 1844. These are as follows :—

1*st.*—*The Arimbrakuta Plantation*, 4 miles south-west of Ariokode, 22 acres, of which 19 acres may be calculated at ¾ths and 3 acres as *Nil*.

2*nd.*—*Manglasherry No.* 1, 8 miles west of Ariokode, on the left bank of the Beypore river, 10·74 acres, classed at ¾ths.

Manglasherry No. 2, a small separate block, 1·1 acre, classed at ¾ths.

3*rd.*—Three blocks on the right bank of the Iravangipoya, which joins the Beypore river and about 3 miles from the last two.

Manglasherry No. 3, 19·58 acres, of which 18 acres are Full and 1·58 acres *Nil*.

Patulathoo and *Chitarakal*, 8·35 acres, all classed Full.

47. The following statement shows the areas of each year yielding full crop : ¼ths, ½ths, ¾ths or *Nil* :—

Year.	Full.	¼ths.	½ths.	¾ths.	Nil.	Total Acreage.
1842	16·00	...	14·93	...	...	30·93
1844	56·00	...	...	6·93	...	62·93
1845	55·00	...	6·33	...	...	61·33
1846	60·00	24·00	16·00	3·00	7·62	110·62
1847	70·00	20·00	16 00	7·00	5·53	118·53
1848	100·00	26·00	24 00	16·00	16·53	182·53
1849	55·00	20·00	25 00	11·00	23·53	134·53
1850	32 00	...	25·00	...	75·22	132·22
1851	55·00	25·00	15·00	15·00	37·19	147·19
1852	20·00	...	10 00	5·00	3·57	38·57
1853	24·00	10·00	9 00	6·89	5·71	55 60
1854	60·00	15 00	10·00	7·33	...	92·33
1855	.	...	30 00	10 00	60·32	100·32
1856	40·00	...	16·00	15·00	8·26	79·26
1857	8·00	...	24 00	..	4·14	36·14
1858	20·00	...	12·00	8·00	2 79	42·79
1859	25·00	...	12 00	...	2·84	39·84
1860	20 00	...	8·00	5·00	6·56	39 56
1861	30·00	...	37 00	8·00	11·5	86·5
1862	30·00	10·00	6·00	...	4·11	50·11
1863	55·00	15·00	8·00	...	3·25	81 25
1864	70·00	16 00	12 00	8·00	15 71	121·71
1865	35·00	...	16·00	5·63	...	56·63

Year.	Full.	¼ths.	½ths.	¾ths.	Nil.	Total Acreage.
1866	76·00	12·00	16·00	12·00	12·64	128·64
1867	80·00	9·00	12·00	10·00	7·63	118·63
1868	87·00	20·00	16·00	10·00	12·40	145·40
1869	30·00	12·00	7·00	...	4·56	53·56
1870	50·00	...	12·00	8·00	4·23	74·23
1871	36·00	...	...	...	10·00	46·00
1872	110·00	30·00	25·00	12·00	30·56	207·56
1873	78·00	20·00	15·00	10·00	18·47	141·47
1874	75·00	15·00	25·00	20·00	25·49	160·49
1875	73·00	15·00	15·00	17·10	40·91	160·91
1876	70·00	...	25·00	15·00	39·00	149·00
Manglasherry Blocks ...	26·35	11·75	19·00	...	4·58	61·68
Purchased Plantation, 1861 and 1869 ...	60·00	...	...	22·00	5·44	87·44
Total ...	1787·35	325·75	539·26	273·78	509·84	3435·98

48. There are many thousand indigenous and planted blackwood saplings and trees about the plantations, estimated by Mr. Ferguson at about 80,000, of which probably 30,000 can be grown to a profit and will some day yield a very considerable revenue.

General Remarks.

49. At about 30 years of age the saplings begin to stop growing in height, at least to any perceptible degree, and they begin to add very rapidly to their bulk; they also taper very much till this period, but soon after they stop growing in height the boll swells considerably upwards and the thickness becomes much more equal throughout.

50. Completely overtopped trees never come to anything in the struggle and should always be thinned out as soon as possible; they are, however, often left a few years standing if the market for saplings be slack or if there be any difficulty about labor.

51. The largest and finest trees are almost always on the outskirts of the plantations, at least up to a certain age, or whilst the trees stand close, which shows how necessary light and air is; but it is also remarkable to see how a few trees on every acre all over the areas take the lead and far outstrip their neighbors. In the older plantations where the trees are now standing at about 100, 120, or 140 only to the acre, many of the inside trees equal or nearly equal the largest on the outskirts; when the plantations are thinned out to hold only the final crop of 60 to the acre, the smaller trees will have disappeared and the growth will be still more uniform.

52. The trees are all wonderfully straight and with only one stem; a crooked tree, a forked tree, or even a fluted tree is very rarely to be met with; this is of course owing to the complete exclusion of fire, and to the exclusion of cattle and the assistance of the pruning knife whilst they were young, and to absence of creepers and Fici.

53. The immense length of boll in every tree will give these plantations an enormous advantage over any teak forest, and the yield here per acre will be out of all proportion to that in any natural forest in India; it however teaches us how much we can improve the yield of our forests by dividing them into blocks, excluding fire and cattle, and paying some attention to pruning whilst the saplings are young.

54. With such fine prospects before us in these plantations, it may occur to many that it would be better to extend these teak plantations to other districts rather than attempt to conserve forests and exclude cattle; the answer must be that

favorable localities are not available. Teak planting on the eastern side of the ghâts or anywhere except under the fullest influence of the south-west monsoon does not promise at all well, in fact it may be pronounced a failure; and teak planting on our mountains within the influence of the monsoon (where plenty of land is available) has hitherto been attended with very poor results. The seed is very difficult to germinate, and the young plants are attacked by all sorts of grubs, insects and vermin, and the subsequent growth, at least up to a certain age, very slow. Then, again, labor is very expensive or often difficult to procure at any price, and there are feverish seasons when supervision is nearly impossible; and last, though not least, the want of water carriage and the expense of transport. Along down the foot of the Cochin and Travancore ghâts there may be localities nearly as favorable as Nelambur, but I can indicate none belonging to this Government.

55. During my visit in January 1871 I thought that I perceived signs of premature maturity, and that the prospect of the trees yielding large timber was somewhat doubtful, and though I had the fact before me that fine teak was produced in the surrounding forest when associated with other trees, I was afraid that the crowding together of the teak without other associates might have an injurious effect. I was also then doubtful as to any successful growth on the laterite soils, and about that time I consequently wrote disparaging the plantations (*vide* my letter in Proceedings of the Board of Revenue, dated 18th June 1872). It is since that time that the older plantations have made such a wonderful start as far as the growth in bulk is concerned, the growth previously having been chiefly in height, and it is only in the last 4 or 5 years that the older portions on the better tracts of laterite have proved that they are fully establishing themselves and likely to give a good yield, though very inferior to that on the alluvial. All the trees are now as healthy as could be wished (the dying off of upper branches before observed on some trees having been caused by Loranths), and I have now few doubts whatever with reference to the future, and as will be seen further on, I anticipate an enormous yield and very large profits.

56. It is of course possible that the crowding together of so many individuals of the same species may induce disease at some future date or result in premature maturity amongst a certain percentage, but I can only state that there are no signs whatever of this at present, and that I do not myself anticipate any such result.

57. As a proof of the late rapid development, I may mention that two trees measured by me in March 1873 as 5 feet 10 inches and 5 feet 3 inches in girth, were measured in May 1876 as 6 feet 1 inch and 5 feet 4 inches,* respectively, and in February 1878 they were 6 feet 8 inches and 5 feet 9 inches; and other trees in proximity with the tree now measuring 5 feet 9 inches now equal or exceed it in bulk, whereas they were less than 5 feet 3 inches in 1873.

* *Vide* my Report recorded in G.O., No. 1,300, dated 20th September 1876.

Past Financial Results.

58. The two following statements show all expenditure (establishment and working charges) and all receipts up to date. Mr. Macgregor, in his report which is only down to 1874, eliminates all charges and receipts on the surrounding forests which are really part and parcel of the land handed over for planting, and he excludes the sale proceeds on timber cut in these tracts and on timber cut on the tracts actually planted; he also only debits a certain portion of the establishment charges (*i.e.*, one-third) against the plantations. This does not appear to me the proper way to treat the question. Certain tracts of forest are taken up by Government for planting, and the felling and sale of the timber removed from the portions planted and the treatment as forest of such portions not adapted for planting are all necessarily part of the same transaction and cannot be treated

separately. By the terms of the agreements we pay 30 per cent. on the net proceeds of all jungle timber cut off plantation sites and 50 per cent. on the same cut in the natural forest, and a stump fee of 1 Rupee on all teak and blackwood trees cut in the natural forest, so that when to these operations two-thirds of the pay of the establishment are also debited, there is a loss instead of a profit; so that Mr. Macgregor's plan is a little in favor of the plantations, although there is not much difference, but it leads to complication.

Abstract of Disbursements in the Conolly Teak Plantations at Nelambur from 1840-41 *to* 1877-78.

Years.	Mortgage or moiety of Kuttikanan paid to Jommies.	Paid to Sanctioned Establishment	Charges on Timber.	Plantations. Floating Saplings.	Plantations. Plantation Charges.	Total.
	RS A. P.	RS A. P.	RS A. P.	RS. A. P.	RS A P	RS A P.
Brought forward from 1840-41 to April 1862	8,536 2 4	33,582 0 3	...		30,256 3 6	72,374 6 1
1862-63 ...	... ..	3,013 2 4		.	3,753 3 5	6,766 5 9
1863-64 ...		4,511 10 0	2,072 0 7	2,294 1 0	3,960 3 0	12,837 14 7
1864-65 .	.	4,126 5 7	3,018 14 6	1,300 11 5	7,623 7 5	16,439 6 11
1865-66 ..	.	4,919 4 2	2,361 5 5	1,817 0 10	7,259 8 0	16,357 2 5
1866-67 .	....	5,485 5 10	1,819 1 11	606 2 9	5,966 15 1	13,877 9 7
1867-68 ..	... .	5,528 15 10	1,044 11 6	150 8 0	7,773 13 4	14,498 0 8
1868-69 ...		6,985 4 10	1,573 4 6	1,847 9 10	6,639 5 4	17,045 8 6
1869-70 ...	4,102 15 2	6,316 6 3	1,967 4 9	50 8 6	5,606 0 7	18,043 3 3
1870-71	200 11 7	6,591 5 2	5,488 0 0	1,195 12 6	7,464 10 7	20,940 7 10
1871-72	5,200 0 0	6,820 0 3	3,962 2 6	1,106 5 3	8,823 6 7	25,911 14 7
1872-73	80,000 0 0	9,355 7 9	3,901 10 4	2,533 4 3	10,606 4 11	1,06,398 11 3
1873-74 .	2,318 8 10	12,942 13 2	2,690 6 6	2,500 12 1	12,490 4 7	31,942 13 2
1874-75 .	102 0 0	9,270 8 9	2,896 12 7	1,782 2 5	11,625 5 5	28,676 13 2
1875-76	100 0 0	9,107 13 11	6,774 3 0	2,175 1 1	8,891 9 5	27,048 11 5
1876-77 ..	100 0 0	10,123 3 11	5,174 8 7	4,965 8 9	7,603 8 2	27,966 13 5
1877-78 .	180 0 0	9,655 5 11	370 5 9	7,582 10 6	5,483 1 2	23,271 7 4
Total ...	1,00,840 5 11	1,47,635 1 11	45,114 12 5	31,908 3 2	1,51,896 14 6	4,77,395 5 11

Abstract of Receipts in the Conolly Teak Plantations at Nelambur from 1840-41 *to* 1877-78.

Years.	Receipts by Sale of Timber.	Receipts by Sale of Bamboos.	Receipts by Sale of Saplings.	Miscellaneous Receipts.	Total Receipts.
	RS A. P.	RS. A. P.	RS. A. P.	RS. A. P	RS A. P.
Brought forward from 1840-41 to April 1862.	* 21,321 0 0	.....	.....	573 0 8	21,894 2 3
1862-63	5,414 0 0	176 0 0	12,044 0 0	88 14 10	17,722 14 10
1863-64	4,279 0 0	1,193 0 0	1,210 0 0	9 0 0	6,691 0 0
1864-65	9,447 0 0	774 0 0	16,776 0 0	162 0 0	27,159 0 0
1865-66	4,585 0 0	720 0 0	9,307 0 0	9 0 0	14,621 0 0
1866-67	10,032 0 0	736 0 0	15,647 0 0	591 0 0	27,006 0 0
1867-68	2,595 0 0	. ...	500 0 0	2 0 0	3,097 0 0
1868-69	6,208 0 0	188 0 0	9,515 0 0	.....	15,906 0 0
1869-70	6,029 13 8	297 10 8	4,173 14 11	.....	10,501 7 3
1870-71	9,894 0 0	573 0 0	5,583 0 0	.....	16,050 0 0
1871-72	7,235 14 0	309 12 10	843 5 9	100 0 0	8,489 0 7
1872-73	7,805 9 2	1,703 6 11	7,378 14 0	257 12 0	17,145 10 1
1873-74	12,411 13 3	531 1 4	11,342 1 8	45 7 3	24,312 7 6
1874-75	6,396 8 8	656 12 9	7,067 12 8	127 14 11	14,249 1 0
1875-76	8,552 0 2	1,050 2 10	10,228 5 10	.....	19,830 8 10
1876-77	18,796 12 10	819 11 4	13,162 2 8	433 11 10	33,212 6 8
1877-78	16,799 15 5	1,044 15 0	4,534 4 0	136 0 0	22,515 2 5
Total ...	1,57,798 11 9	10,755 9 8	1,29,312 13 6	2,535 13 1	3,00,402 13 5

* Proceeds by kuttikanam and sale on timber and bamboos previous to the year 1862-63.

59. These two statements show all the different charges and receipts under their proper heads. Of the Rupees 1,57,798-11-9 accruing up to 1877-78 from the sale of timber, the following statement shows what sums have been derived from timber felled on the plantation sites and what from the forest tracts as yet unplanted :—

Timber Receipts from Sites cleared for fresh Planting and from outside Jungles or Forests.

Source derived from	Receipts						Total			Remarks
	Sites for fresh Planting.			Jungles or Forests.						
	RS	A	P.	RS.	A.	P.	RS	A	P	
Receipts from 1840 to 1862, Rupees 21,321-2-0, for which there are no details, may fairly be divided thus.	10,660	9	0	10,660	9	0	21,321	2	0	Up to 1872 the bulk of timber receipts was realized from clearings for fresh planting, and subsequently from jungles and forests.
From 1862 to 1873 . ..	66,734	11	8	6,785	9	2	73,520	4	10	
„ 1873 to 1877	11,765	9	6	34,391	12	0	46,157	5	6	
„ 1877 to 1878 ..	8,341	14	8	8,458	0	9	16,799	14	5	
Total Receipts ...	97,502	12	10	60,295	14	11	1,57,798	11	9	

60. Column No. 1 of the statement of disbursements requires some explanation.

61. Of the Rupees 8,536-2-4 paid on the conclusion of the mortgage with the Trikalayur Pagoda, Rupees 1,000 is the mortgage fee and Rupees 7,000 is an advance, I believe, to be recovered from sums due as Kuttikanam, but I cannot learn why, if this is the case, this sum has not been liquidated and written off as timber has been felled. I have not been able to learn what the Rupees 536-2-4 relates to, but both relate to transactions before Mr. Ferguson's time and the latter is probably Kuttikanam.

62. The Rupees 4,102-15-2 paid in 1869-70 is Kuttikanam or stump fee paid on timber felled; the 200 paid in 1870-71 is the same.

63. Of the 5,200 Rupees paid in 1871-72, 5,000 Rupees is the purchase-money for the Chetamborai Block and Rupees 200 the renewal fee or 20 per cent. on Trikalayur mortgage fee, a sum payable every 30 years.

64. The Rupees 80,000 paid in 1872-73 is the purchase-money for the Amrapolliam and Karampoya Blocks.

65. Of the Rupees 2,318-8-10 paid in 1873-74, Rupees 2,214-8-10 is a sum paid for stump fee, Rupees 100 a sum payable annually on the Amrapolliam and Karampoya Blocks, and Rupees 4 two years' payments of a sum of Rupees 2 due annually as a jemmis right on Nellicootah.

66. The Rupees 102 paid in 1874-75 are the sums payable annually as jemmis right on Karampoya and Nellicootah.

67. The Rupees 100 paid in 1875-76 and 1876-77 is the annual Karampoya payment.

68. Of the Rupees 180 paid in 1877-78 Rupees 100 is the same, and Rupees 80 a sum for depôt rent at Kalai.

69. The Trikalayur Pagoda land was obtained by Mr. Conolly in 1840 for such term as Government might wish to retain possession, the only payment being a fee of Rupees 1,000, with a renewal fee of Rupees 200 every 30 years; a stump fee (or Kuttikanam) of 1 Rupee was payable upon all natural teak and blackwood trees which might be felled; and 30 per cent. on the net proceeds of all timber felled and removed from plantation sites, and 50 per cent. on all jungle timber cut in the natural forests, and a stump fee of $\frac{1}{2}$ Rupee on all planted teak trees on their becoming fit for cutting, and 2 per cent. on the net proceeds from bamboos.

This land includes all the Nelambur Block except small bits of 1853, 1847 and 1848 across the river opposite the palace which belonged exclusively to the Rajah, and for which 1 Rupee stump fee on planted teak trees cut as timber is payable, but for which no purchase-money was paid; it also includes all Panyangote and Waluvaisheri.

70. The Chetamborai Block, north of Panyangote and Waluvaisheri, as first proposed to be taken up by Mr. Ferguson, was fully 2,000 acres, including a large portion north of the tract secured; it belonged to Neddiwati Numbadri Pad, a Brahmin living near Wundoor, and Mr. Ferguson recommended that it should be secured on the same terms as the other land and an advance towards Kuttikanam of Rupees 5,000. The Rajah, however, put in a claim to the land, and Mr. Ballard, who was then Collector, refused to purchase; subsequently Mr. Macgregor purchased the restricted area of only 700 acres for Rupees 5,000 with an agreement to pay a stump fee of 1 Rupee on each sapling cut at maturity. The Plantations of 1872 and a portion of 1873, 74 and 1875 are situated on this block; it does not appear that this office was consulted about this purchase.

71. The Nellicootah Block, about 3,000 acres, belonged to the Zamorin of Calicut and was secured without any payment or advance whatever, except a nominal payment yearly of Rupees 2 and a stump fee of 8 Annas on each planted tree cut at maturity, and other terms as in the Trikalayur Pagoda land. 74·23 acres were planted here in 1870, and about 46 acres (not surveyed) in 1871; but after that year all planting was stopped as the locality was found to be so exceedingly feverish.

72. The Amrapolliam and Karampoya Blocks were purchased in 1872-73 for Rupees 80,000, rather hastily I think, at a higher figure than was asked and much against my advice, as will be seen from my letter to the Collector of Malabar, recorded in G.O., No. 668, of the 14th April 1871, and my letter to Government in G.O., No. 171, of 20th July 1872, and my letter to the Board of Revenue, dated 12th June, recorded in the Proceedings of the Board, No. 1,036, of the 18th June 1872. The Supreme Government however was asked to sanction the purchase on the 8th of June before my last letter was forwarded to Government by the Board and whilst I was very ill, and the purchase was effected when I was absent on sick leave in Australia. There is also an annual payment of Rupees 100 due by us as jemmibogam, but no stump fee or other payments.

73. Of this 80,000 the sum of Rupees 10,000 was fixed as the price of the old plantation (87·44 acres) at Amrapolliam, which was part of the purchase, and 10,000 Rupees are debited against the Amrapolliam Block, 386·89 acres, of which all but 65·46 acres were planted up in 1873, 74, 75 and 1876. The balance, Rupees 60,000, are debited against the Karampoya Block, which is 3945·60 acres, and still remains as forest, and which I will revert to further on in this report.

74. It appears, therefore, that we have received 333·89 acres short or paid in excess Rupees 5,008-5-7, as the agreement was, I believe, to pay Rupees 15 per acre. The survey and calculations were made during Mr. Ferguson's absence, whilst the forests were under the Collector, and I think that the latter might still put in a claim for the balance of the forest land due. No allowances, moreover, were made for swamp, streams and rock in the tract purchased for planting, which is, I believe, usual in all such cases.

75. Mr. Ferguson informs me that the Trikalayur Pagoda Trustees have become very dissatisfied with the terms of their lease since the much more favorable terms obtained by the Amrapolliam Rajah, and that they have on several occasions laid claim to the payment of the 8-Anna stump fee on all saplings felled out in thinning operations, but that the Collector has always overruled the claim. It could not of course be allowed on all saplings, and the intention of the agreement was evidently that it should only be paid on trees felled at maturity for timber. Government, however, might sanction its payment on all saplings over a girth of 6 feet at 6 feet from the ground.

76. The saplings have sold very well of late years, and the receipts of the plantations have nearly equalled the expenditure; but this year there has been no

market for the saplings, and some 30,000 remain unsold at Calicut. This is probably owing to the famine, and I do not anticipate that we shall have a difficulty in selling: the size and quality of the saplings will annually improve, and the receipts should shortly far more than cover all disbursements for establishment and working charges.

Future Prospects.

77. The age at which the planted teak will come to maturity, the size it will grow to, the quality of the wood, and the price it is likely to demand when thrown into the market in very large quantities are all questions that must be carefully considered with the data now available.

78. *The age at maturity.*—This is a question on which there might be much difference of opinion; I believe that the trees on the alluvial will reach maturity at 60 or 80 years, but that they will then stand 40, 50, or 60 years before old age or decay to any extent sets in. Mr. Ferguson agrees with me as to the size that they will reach at about 60 or 70 years, and that there will be large marketable timber then; but he thinks that the trees will probably go on growing till they are 150 years of age, and that they will be able to stand many years after that. Even if this should be the case it will be more profitable to fell them when they reach a good marketable size, say a quarter girth of 18 to 24 inches, rather than wait for larger growth, though, of course, some would be left for large timber if it was seen that they continued to add to their bulk.

79. With reference to the trees on the laterite portions classed as ¾ths and ⅘ths yield, I feel very diffident about giving any decided opinion; but I think that the age of maturity will probably be a good deal longer than that of the trees on the alluvial. These portions of the plantations should be very carefully examined every 5 years or so, and careful statistics as to the height and girth and general health recorded.

The size the Trees will grow to, and the cubic contents per acre.—This question is very exciting and interesting.

80. *The length of Boll.*—The first step is, I think, to fix the average length of boll in the older plantations: 95 feet is now about the extreme length. There are many trees far over 80; 50 feet is the shortest to be found of the trees that will be selected for the final crop, and there are very few trees of only this length. The following table shows the measurements of a certain number of the longest, shortest and medium size, taken from trees in the four oldest plantations with a view to getting the average.

81. Statement showing the measurements of six longest, shortest and medium sized trees selected in the four oldest plantations, and the average height of boll, &c.:—

Name and Year of the Plantation.	Longest.					Shortest.					Average.			
	No.	Length.	Circumference.			No.	Length.	Circumference.			Length.	Circumference		
		FT.	FT.	IN.	PA.		FT	FT.	IN.	PA.	FT.	FT.	IN	PA.
Iravelly Kava, 1844 ...	1	84	6	1	6	1	50	3	8	0	67	4	10	9
	2	85	6	2	0	2	...	3	6	0	65	4	10	0
	3	87	5	9	0	3	...	4	9	0	68	5	3	0
	4	85	6	4	0	4	...	3	4	0	65	4	10	0
	5	77	6	8	0	5	...	2	8	0	61	4	9	0
	6	87	5	10	0	6	...	4	7	0	70	5	2	6
	7	90	4	8	0	7	...	3	5	0	70	4	0	6
	8	95	4	0	0	8	...	3	1	6	72½	3	6	9
Total Averages ..	...	86¼	5	8	3	...	50	3	7	6	68	4	7	10

Name and Year of the Plantation	Longest					Shortest					Average			
	No	Length	Circumference			No	Length	Circumference			Length	Circumference		
		FT	FT	IN	IA		FT	FT	IN	PA	FT	FT	IN	IA
Elanjorry, 1845	1	80	5	1	0	1	50	2	4	0	65	3	6	6
	2	85	5	2	0	2		2	2	0	67½	3	8	0
	3	90	5	3	0	3		3	4	0	70	4	3	6
	4	75	5	8	0	4		2	8	0	62½	4	2	0
	5	85	5	4	0	5		3	0	0	67½	4	2	0
	6	85	5	2	0	6		2	7	0	67½	4	0	0
Total Averages		83½	5	3	4		50	2	6	2	66¾	3	10	9
Eddacode, 1846	1	85	5	9	0	1	50	3	0	0	67½	4	4	6
	2	90	5	8	0	2		2	5	0	76	4	0	6
	3	70	5	6	0	3		2	10	0	60	4	1	0
	4	80	6	4	0	4		2	0	0	65	4	2	6
	5	70	5	7	0	5		2	7	0	60	4	1	0
	6	85	5	9	0	6		2	1	0	67½	3	10	0
Total Averages		80	5	9	2		50	2	6	0	65	4	1	7
Moolathamanoo, 1847	1	80	5	6	0	1	50	2	8	0	65	4	0	0
	2	76	5	3	0	2		2	7	0	63	3	0	0
	3	76	5	0	0	3		2	9	0	63	3	10	6
	4	85	5	9	0	4		2	5	0	67½	4	1	0
	5	75	5	8	0	5		2	2	0	62½	3	11	0
	6	85	5	8	0	6		2	0	0	67½	3	10	0
Total Averages		79½	5	6	8	..	50	2	5	2	64¾	3	11	4

82. The table also gives the girths of the same trees, but the trees in question were only selected with reference to their height.

83. It will be seen that this gives an average of 68 feet and 1 inch in the oldest plantation, 1844; but as most of these trees are still adding slightly, though rather imperceptibly, to their height, and the selection of an equal number of the very shortest trees of only 50 feet being scarcely fair, as there are very few of these, the average may, I think, be fairly fixed at 70 feet for the alluvial.

84. The average on the laterite does not, I think, promise to be more than 50 or 55 feet, and this is compensated for by only calculating the yield at ⅔ths and ⅓ths, but the trees on those soils are not yet sufficiently matured, I think, to calculate it with any accuracy; they are still growing in height in the oldest portions and have taken a wonderful start this way during the last 4 or 5 years.

85 *The Girth and Cubic Contents.*—If the table of the measurements of saplings cut as a fair average of those which will stand for the ultimate crop (given after paragraph 4) be consulted, it will be seen that the yearly rate of growth was 1′ 2¾ during the first decade, 1′·3 5/12 during the second, and 1′ 9 1/12 during the third; but the rapid growth in bulk has only commenced towards the end of the third decade, when the trees began to stop growing very perceptibly in height, and the average for the last half of the third decade is at the rate of 2′·3 1/12 per annum. I anticipate that the rates during the fourth and fifth decades will be at least 4 cubic feet per annum, if not 5 or even 6; the late thinnings, which reduced the trees to about 120 per acre on the older plantations, have, by letting in more light and air and more root room, given a very great spurt to the development, and many trees have, I am convinced by actual measurements, been growing at this rate during the last 2 or 3 years, and when they are felled out to stand only the 60 to the acre, their development will be still more rapid The specimen sapling cut

out of the 1847 Plantation has, Mr. Ferguson informs me, grown by his personal observation fully if not more than 5 cubic feet annually during the last 4 years.

86. To illustrate the rate of growth as far as the girth is concerned, I forward for submission to the Secretary of State a small cross section of the boll of each of the saplings already alluded to from the plantings of 1873 back to 1844 (30 specimens in all); the bark and some of the outer sapwood is somewhat injured by white-ants, but the heart-wood is in perfect condition.* These specimens can, if necessary, be sawn across again to form two complete sets for different museums: a complete set of much longer specimens was cut from the lower or thicker portion of the boll and forwarded to Calcutta for the Paris Exhibition, but I observe that Doctor Brandis only forwarded half of these, or those of alternate years, and these are to be deposited in the Nancy Forest School in which our Indian foresters are now trained.

87. In the 1868 Plantation, as alluded to in my notes of that plantation (*vide* paragraph 36), I found a natural teak tree 7 feet 9½ inches in girth 6 feet from the base, boll 40 feet long, being forked at that height (from injury when young), the girth nearly equal throughout. Mr. Ferguson informed me that he had long watched this tree, and that when he planted this site it was a mere sapling, not more than 4 feet in girth, otherwise he would have felled it as he removes all teak trees that will yield a profit as timber from plantation sites as the shade is injurious; it was at that time, with some other small trees near it, much shut in by the dense growth of many jungle trees, but after the felling of the latter and the consequent admission of light and air its development was very rapid. I had this tree felled, and the rings prove that its growth was very slow during its infancy, but very rapid during the last 15 or 20 years; between the age of 12 and 20 and again between 25 and 30 it had evidently received much check, the rings of those periods being exceedingly close and difficult to distinguish: its age is not more than 57 years or less than 55; this gives us good data, but I expect our planted trees to be much more rapid in their growth, for this tree received no attention for 46 years, and was deprived of the necessary amount of light and air and room for development of a good head, and was subject to fires and other rough treatment whilst young, as proved by a certain amount of fluting.

88. By the table of specimen saplings (*vide* paragraph 4), it will be seen that the sapling cut in the 1847 Plantation had more than 102 cubic feet of marketable timber in it; it was however a mere sapling, its girth round the centre of the boll being only 4 feet 10 inches, girth at 6 feet from the base 5 feet 4 inches, and girth at very base 8 feet 9 inches: if this tree had not been felled and only grew at the same rate during the next 30 years, it would have upwards of 200 cubic feet at 60 years of age, but its rapid development had only set in during the last 2 or 3 years, and the rate of growth during the next 30 years would in all probability far exceed what it has been during its infancy. This was certainly one amongst the largest trees in the plantations, but there are others equal to it, and many trees carrying 70 cubic feet; it is only however during the last few years that there has been this great development in girth and wonderful promise of large timber. Until the trees began to stop growing in height they were in most cases mere spindles; now there are quantities of trees over 5 feet in girth at 6 feet from the base, and a good sprinkling over 6 feet.

89. Thanks to immunity from fire and injury by cattle and the destructive influences of creepers, parasites, &c. whilst in their infancy, all the trees are perfectly healthy and there is no sign of disease of any sort, and a fine clean straight growth has been secured by judicious pruning. 60 of the best and largest only of these, which are all fine and healthy, will eventually stand on each acre, and there can be no reasonable doubt that each of these will attain a girth of 8 feet in the centre; we know that this size can be expected from the indigenous growth here and in similar places at the foot of the Travancore ghâts, and even if larger dimensions were certain, it would be more profitable to fell at this size or even at a somewhat

* These have all been polished on one side, and the rings show clearly the age and annual development

smaller girth than to wait for further growth except to meet special indents. The rate of growth will not be uniform in any plantation, we know this by experience of the growth up to date; many trees will probably attain this size in 60 years, whilst their neighbours may take 65, 70 or even 80 years to reach it: so we shall never have anything like a clean cut over of a plantation or of even any acre at a certain date, and as we pay nothing for the land, there will be no object in clearing it rapidly. When the felling of some of the largest trees in the 1844 Plantation commences in 1901, or perhaps somewhat earlier, there will certainly be many trees not sufficiently developed for felling in the same plantation, though some will be quite fit for the axe in some of the later plantations, say the next 3 or 4 years, or the plantations of 1845, 46, 47 and 1848.

90. *Cubic Contents per Acre.*—This can only be considered at present with a very wide margin: allowing our trees to attain a quarter girth of 2 feet in the centre of the boll, our 90 feet trees will give 360 cubic feet of timber and our 60 feet trees 240 cubic feet, and 50 feet trees, which will be scarce, 200 cubic feet; our average boll is, as I have shown, 70 feet, and this gives 280 cubic feet as the average tree, so that if we are guided by figures and present statistics, we shall have 60 trees, averaging 280 cubic feet each, or 16,800 cubic feet; and if we deduct 25 per cent. from this for the chance of disease, windfalls or other causes, 12,600 cubic feet to the acre; this would be enormous compared to the yield per acre in any of our teak forests where the teak has many associates, and where long bolls are the exception and not the rule (owing to various injuries whilst in infancy); but these trees would be very small compared to some of the gigantic trees which we have felled in the Anamallays, which have given as much as 1,920 cubic feet out of an 80 feet boll, and I see no reason to doubt that there will be this yield off most acres on the alluvial. I do not, however, wish to make calculations at this high rate, and think it will be sufficient if we allow 6,000 cubic feet per acre as full stock, and it must be certain that this will be well within the margin, as no tree with our length of boll will ever be felled unless it contains much more than 100 cubic feet, as is proved by the specimen lately felled in the 1847 Plantation, which contained 102 cubic feet though a mere sapling. I had half an acre measured off in two different blocks of Plantation 1844, and in one block in 1845, 46, 47, 48, 58 and 1868 every tree measured and its cubic contents calculated. Appendices A to H are full particulars of the measurements and cubic contents of each tree, and the following is an abstract:—

Abstract of Measurements of Half an Acre in Plantations 1844, 45, 46, 47, 48, 58 *and* 1868 (vide *Appendices A to H.*)

No.	Name and Year of Plantation.	No. of Trees	Cubic Contents per ½ Acre			Remarks.
			FEET.	IN	P	
1	Iravelly Kava, 1844	60	2,439	6	8	Appendix A.
2	Yeddacode, 1844	64	2,140	3	10	Do. B.
3	Elanjerry, 1845	79	2,371	3	8	Do. C.
4	Do. 1846	78	2,102	3	3	Do. D.
5	Do. 1847	70	1,856	3	9	Do E.
6	Do. 1848	78	1,621	9	6	Do. F.
7	Do. 1858	135	1,101	4	9	Do. G.
8	Walluvaisheri, 1868	375	1,245	6	4	Do H.

91. By this it will be seen that about 120 trees now stand to the acre in the 1844 Plantation, and that the cubical content is 4,879 feet per acre; and in the 1845 Plantation 158 trees carry a cubic content of 4,742 feet, the 1858 Plantation 270 trees, 2,202 cubic feet, and the 1868 Plantation 750 trees, 2,491 cubic feet.

92. These measurements must not be taken as illustrating the growth of the final crop, as all but the best 60 per acre will be in time thinned out; the others are only in the meantime acting as nurses.

93. It will be seen that in one of the two half acres measured in the 1844 Plantation, two trees already carry more than 100 cubic feet.

94. The planting is 6½′ × 6½′, which gives 1,040 saplings to the acre. The following statement shows the periods at which the different thinnings take place and the percentage thinned out:—

Statement showing the Number of Seedlings planted per Acre, Age of successive Thinnings, Number thinned out and remaining per Acre.

Number of Thinnings.	Age in Years.	Per cent. of Thinned.	Number thinned out.	Number per Acre Planted.	Number per Acre remaining
		6½ × 6½′ gives		1040.	
1	9	29 p. c.	301	...	739
2	11	25 „	185		544
3	13	25 „	136	...	408
4	16	25 „	112	..	296
5	20	20 „	59	...	237
6	25	20 „	47	...	180
7	32	20 „	36	..	144
8	40	20 „	29	...	115
9	50	20 „	23	..	92
10	63	20 „	18	...	74

The numbers remaining are of course never exact, only approximate, and different acres in the same plantation vary to a certain extent. This plan has been carried out up to the thirty-second year, but it is very doubtful whether it will be so up to the sixty-third year. The growth of late has been so much more rapid than anything we ever expected, that it will probably be advisable to reduce the number to 60 per acre at the age of 45 years; but a forester's eye will tell him what is necessary as the time advances, though it is certain that the last thinnings will be well before 60 years of age.

95. It will be seen that Mr. Macgregor estimated only for 2,500 cubic feet per acre or 50 trees at 50 cubic feet each; this was an estimate without any measurements or statistics, and in putting it forward I suppose he followed Captain Seaton's rough estimate of 2,500 cubic feet per acre; but Captain Seaton visited those plantations very many years ago, before the growth was such as to authorize any estimates or anything beyond a rough guess, and he probably had in his mind the yield in teak forests, and certainly can never have calculated for the great length of boll, and I think I have conclusively shewn that no tree at maturity can ever be felled with as small a cubic content as 100 feet, and the measurements and statistics show that we shall probably have 8, 10, or 12,000 cubic feet to the acre at 60 years of age.

96. The statement after paragraph 47 gave the areas in each plantation, which are expected to yield Full, ¼ths, ½ths, ¾ths, and *Nil*. The following is an abstract of this with the totals of cubical contents expected from the acreage, estimated at only 6,000 cubic feet per acre = full stock:—

Acres.					Cubic Feet.
1787·35 Full		..		..	10,744,100
325·75 ¼ths	...	.		...	1,563,600
539·26 ½ths		...	...		1,941,336
273·78 ¾ths	...				657,072
509·84 Nil		...	...	...	...
			Total		14,906,108

3435·98 acres equal 2,484¾ acres yielding full crop.

Our oldest plantation is 1844, our youngest 1876; allowing 60 years for maturity, felling commences in 1904, and allowing the trees to stand 50 years after maturity, felling of the present stock need not cease till 1986: this gives, at the lowest estimate that can be put forward, 14,906,108 cubic feet as available during these 82 years, or 183,000 cubic feet annually. The stock however might probably stand over one hundred years if necessary, and though I have put down 60 years as the age at which felling is to commence, it is, I may say, certain that there will be much marketable timber available at or soon after 50 years of age. Long before the 60 or even 50 years have expired there would, of course, be accurate plans of all the older plantations, shewing in full detail the size of the trees, &c., and the plantations could be worked by orders from the Conservator's Office wherever it might be.

97. At present there would be no market at Calicut for 180,000 cubic feet of teak annually, but there need, I think, be no apprehension on this score: when it becomes a certain annual supply, a market will be obtained; it could be sold at such prices that Burma teak could be thrown out of the Madras market, and with good saw machinery either at Nelambur or at Calicut, it could be worked up into scantlings to meet the Government and private demands of a greater portion of this Presidency as well as Bombay.

98. *The quality of the Wood.*—This has never been tested yet, and it is probable that it may be very inferior to mountain teak, at least for the purposes of furniture; but there can be no doubt about its being good serviceable wood for building and many other purposes, and Mr. Ferguson sells the natural teak grown in the same localities at prices going up as high as Rupees 2-4-0 per cubic foot.

99. *The price the Timber is likely to realize.*—This will probably vary year by year; good sound teak is not procurable now at Calicut under Rupees 1-8-0 to Rupees 2 per cubic foot, and larger prices are given for long lengths. It is not possible to estimate what the price may be thirty years hence, though I feel sure there will be a great scarcity in the interim; but about that time large quantities will also be maturing in the Anamallays, Wynad and Mudumally. About the future of the Burma market I know nothing. The following statement is Mr. Ferguson's estimate for felling, removing and floating timber to Calicut, by which it will be seen that the charges are scarcely over 3 Annas per cubic foot for delivery and storing there from the Nelambur Block, and not 5 Annas from Nellicootah and Karampoya; and as Mr. Macgregor says, inferior jungle timbers not fetching more than 4 or 5 Rupees per candy (12½ cubic feet) are felled and floated to Calicut and sold at a profit.

Estimated cost per Cubic Foot of Timber to fell, dress, and store in Plantation Depôts; thence Transport and Storing Charges in the Kalai Depôt, Calicut.

Name of Plantation	Felling Charges	Dressing Charges.	Storing Charges in Plantation Depôts	Transport to and Storing Charges in the Kalai Depôt.	Total Charges.	Remarks.
	RS A P.	RS A P.	RS. A P	RS. A P	RS. A. P	
(a) Nelambur Block	0 0 2	0 0 2½	0 1 6	0 1 3	0 3 1½	(a) These rates of working charges are inclusive of subordinate, but exclusive of executive supervision.
* Nellicootah	0 0 2½	0 0 3½	0 1 10	0 2 6	0 4 9½	* 25 per cent. added on cooly hire, and 100 per cent. added for increased length and difficulty in transport charges
* Karampoya	0 0 2½	0 0 3½	0 1 10	0 2 6	0 4 9½	

100. Considering the very small charges necessary to bring the teak to one of the principal timber markets, I think we may safely value it at 10 Annas per cubic foot not profit as it stands in the plantation, and I have little doubt that at any time trees could be marked and sold at that rate (if not for much more), the removers

bearing all the expenses of felling and removal. This would represent a profit of upwards of 90,00,000 Rupees on the ultimate or mature crop. Of late the plantations have been nearly paying their expenses by the sale of saplings, and year by year these profits should be greater, and shortly the necessary thinnings will be more of the character of timber than saplings, and will probably pay off all debts (including interest on outlay) against the plantations; but should they not do so when we commence to cut into the mature crop some 20, 25 or 30 years hence, any balance that there may be against the plantations will be rapidly liquidated.

101. I need not recapitulate any of the interesting information or touch upon any of the points explained by Mr. Macgregor in his report, to which this may be considered as a statistical appendix, and the maps he has submitted will equally answer for this report.

102. Appendix I is a register of areas planted yearly from 1840 to 1876. Appendix J is a register of surveyed areas of natural forest and teak plantations in the several blocks comprising the Nelambur Forest Division.

103. *Extension of Planting.*—With the certainty that there will be at least 180,000 cubic feet of teak, and probably much more available after 1904, every year for about eighty years, is it desirable to extend the plantations. At present I think not, and that all the services of the establishment should be employed in the up-keep and improvement of the present plantations; replanting need not again begin till about 1900.

104. *Area available for Planting.*—Within the limits of the Trikalayur Pagoda land, and for which we pay nothing, there is still some land available, viz., in Panyangote there are still about 100 acres good alluvial. In the Pakode Block across the Adianpoya river from Chetamborai there are about 130 acres good alluvial, and in Kanakote across the Eyathod river from Chetamborai nearly 200 acres good alluvial. It seems a pity that these 430 acres should not be planted, as they form a compact block with the rest of the Trikalayur land and we shall have to pay nothing for the land.

105. In Nellicootah there are 1703·93 acres superb land for planting, but the locality has proved so deadly and so entirely disorganized the whole establishment that I could not recommend our again attempting operations in this quarter. This forest tract, however, should certainly be fire-traced.

106. At Eddiambodum, on right bank of the Shurliar, north-west of Yeddicarrah there is a block of 300 acres (colored green in Mr. Macgregor's map) belonging to us, but the success of planting here would be doubtful as it is almost certain to be very feverish. Neither can I recommend that planting should be carried out in the Karampoya Block, for which we have paid 60,000 Rupees; the area is 3945·60 acres, but of this 15 per cent. must be deducted for nullahs, swamps, rocks, &c. I went carefully over this with Mr. Ferguson again this time, and my views concerning it are still the same as expressed in my letters referred to in paragraph 72. It is splendid soil, but the forest is too good to fell, and from its close proximity to the hills I feel sure it will prove quite as unhealthy as Nellicootah directly the soil is broken up. Another serious drawback is that the wild elephants are here so numerous and impudent that Mr. Ferguson thinks planting would be a failure, unless we had an elephant trench 6′×6′ all round, which would cost at least Rupees 20,000. I am of opinion that the tract should be fire-traced and treated as a natural forest. Most of the fine teak was felled out before we purchased, but there is plenty coming on mixed with much fine jungle timber which, however, is not of very much value here (though it may be during the next 30 years when teak will certainly be scarce), and the growth of the teak will be greatly benefited and increased by fire-tracing.

107. When the older plantations are thinned out to 60 trees to the acre there will, I think, be plenty of light and air to raise a second crop between the trees. The alluvial soil is much improving from the annual debris enriching it, and we could avoid all laterite tracts and select only the best ground. 400 seedlings per acre

might be planted the usual distance apart; of course many of these would come to nothing, but be required as nurses to draw up those destined for the second crop. It would be an experiment only and the success somewhat doubtful, so should at first only be tried on a small scale.

108. The cost of collecting seed, preparing nurseries, germinating and planting out and maintenance for the first year would not exceed 7 Rupees per acre, and subsequent up-keep, weeding and pruning about 1½ Rupees per acre.

109. Mahogany grows so splendidly in the climate of Nelambur and in amongst the teak trees (not objecting to shade) that I strongly recommend a quantity of seed being procured. It should be sent direct from the Honduras (or at least not be allowed to be detained in England as a former supply was). The seeds should be taken out of the capsules and packed in a mixture of dry saw dust and charcoal dust or dry silver sand and charcoal dust.

110. It will not be fair to debit any of the 80,000 Rupees paid for the Amrapolliam and Karampoya Blocks against the Nelambur Block of plantations; of this sum 10,000 Rupees is debited against Amrapolliam (321·33 acres planted up in 1873, 74, 75, 76) and 65·46 acres unplanted, and 10,000 Rupees against the purchased plantation, which was partly planted about the year 1860 and partly in 1868, and is 87·44 acres. The accounts of these two are kept distinct from Nelambur, and should continue to be so under the head of Amrapolliam Extension, and the debt of Rupees 60,000 must remain against Karampoya.

111. A sum of Rupees 5,000 was paid for the Chetamborai Block, but I think it may be incorporated in the accounts with Nelambur, as Nellicootah should also be; separate accounts or returns would add greatly to office work, which is already far too heavy.

112. Should an estimate be required for the planting up of Karampoya I can submit one, but I do not submit it with this report as it appears to me unlikely that Government will wish to extend planting in that direction at present; the rest of the Nelambur Block should certainly be planted first, and we should get rid of the wild elephants; but 30 or 40 years hence, when larger extensions may be desirable, the conditions relating to Karampoya and Nellicootah may be very different. I may, however, mention that taking into consideration compound interest on the large sum paid and the expense necessary for an elephant trench, planting would still pay.

113. Nelambur is now most instructive, and I think that all Forest Officers who have anything to do with teak or teak plantations, should be allowed to visit it and spend a fortnight or three weeks in going through plantations of different ages, taking measurements and studying the growth on the different soils, &c.: in this case another bungalow should be built at a cost not exceeding 4,000 Rupees.

114. I have been visiting these plantations almost annually since 1857 and constantly taking measurements, but I never realized their great value till this visit, when I went critically into all questions relating to their future, a subject which I certainly found most engrossing and exciting; but it is only within the last three or four years that the signs of the great future in store for them have become so startling and apparent.

115. I cannot close this report without testifying to the unremitting care and attention that Mr. Ferguson has given to these plantations during the last 16 years, and I do not think that they would be in the fine condition they now are unless we had had the advantage of his practical knowledge of pruning, thinning, &c. Mr. Ferguson's health has been much broken by the fever contracted at Nellicootah and he purposes retiring shortly, and he is afraid that his health will not allow him to pursue his profession in England, and he is no longer young. I trust that the Secretary of State may be asked to consider his claim to pension as a special case, for I think that he should receive one of £250 per annum.

116. The work of this range is very different to anything else in the department, and the officer in charge cannot do justice to the work unless he is out a

great deal himself during the day and able to bear a great deal of exposure; in fact we want a fairly educated man of the working class, who thoroughly understands timber and plantations, rather than a Deputy Conservator and gentleman. Nelambur itself is not apparently feverish, though some of its surroundings, like Nellicootah, are very much so, but the climate is most trying and like a steam-bath all the year round, and the place is perfectly isolated from all society and quite an inhospitable region. I would recommend that a forester be procured from Scotland and placed under Mr. Ferguson to learn his work before the latter leaves; he should be under a special agreement to serve 15 or 20 years; he should receive at the rate of £150 per annum whilst learning under Mr. Ferguson, but he should receive not less than £250 per annum afterwards for the first five years, £300 for the next 5, £400 when 10 years' service, and £500 when 15 years, or on a scale somewhat similar; and he should be allowed a pension of £250 after 20 years. Doctor Cleghorn or Colonel Pearson would be able to select a man; he must be of strong constitution and active habits to stand the work and exposure, and must be fairly educated to be able to keep the accounts and conduct the office work, and he should have a thoroughly practical knowledge of timber and the treatment of plantations; the rest he can quickly learn under Mr. Ferguson.

R. H. BEDDOME, Lieut.-Colonel,
Conservator of Forests.

APPENDIX A.

Measurements of Half an Acre in Plantation, Iravelly Kara, 1841.

Number	Length of Stem.	Quarter Girth at Centre of Stem.	Contents.			Number.	Length of Stem.	Quarter Girth at Centre of Stem.	Contents.			Number.	Length of Stem.	Quarter Girth at Centre of Stem.	Contents.		
	FT.	IN.	C.FT.	IN.	P.		FT.	IN.	C.FT.	IN.	P.		FT.	IN.	C.FT	IN.	P.
1	50	8¾	26	7	0	21	65	13¼	79	2	11	41	55	15¼	88	9	10
2	75	8½	37	7	6	22	55	12½	59	8	1	42	40	10½	30	7	6
3	45	7½	17	6	11	23	70	10¼	51	0	10	43	65	8¼	30	8	7
4	40	6	10	0	0	24	70	11½	61	6	3	44	60	9½	35	7	9
5	75	12	75	0	0	25	65	7½	25	4	7	45	45	9¾	29	8	5
6	70	10	48	7	4	26	75	11¼	65	11	0	46	70	10	48	7	4
7	75	6½	22	0	0	27	70	10½	53	7	1	47	65	12	65	0	0
8	50	9¾	33	0	1	28	55	10¼	40	1	6	48	90	8¼	42	6	5
9	60	8½	30	1	2	29	80	11¾	28	9	1	49	45	8½	22	6	11
10	70	10½	53	7	1	30	80	8¼	37	9	8	50	50	12	50	0	0
11	40	5¾	9	2	2	31	45	9¼	26	8	10	51	65	9¾	42	10	10
12	55	7½	21	5	9	32	80	10½	61	2	11	52	45	6¾	14	2	10
13	50	8¼	23	7	7	33	65	10½	49	9	1	53	70	11	58	9	10
14	60	11½	55	1	2	34	80	13¾	105	0	4	54	40	8¼	18	10	10
15	65	13¾	85	4	0	35	45	8¼	21	3	2	55	35	9½	21	11	2
16	60	8¾	31	10	9	36	70	7½	27	4	1	56	35	7	11	10	11
17	70	8¼	33	1	0	37	65	7½	25	4	7	57	35	7½	13	8	0
18	60	11¼	52	8	9	38	50	8¼	23	7	7	58	35	7¾	14	7	2
19	75	10½	54	8	7	39	70	8¼	33	1	0	59	50	9¼	29	8	6
20	75	8¼	35	5	4	40	65	15	101	6	9	60	30	12¾	33	10	4
														Total ..	2,439	6	8

Average ¼ girth per tree = 9½ inches. Average cubic contents = 39′.6.6

The thirty best only will stand to maturity; the other thirty are acting as nurses, and will be felled out probably before 1889, certainly by 1894.

APPENDIX B.

Contents of Half Acre in Plantation Eddasode, 1844.

Number.	Length.	Quarter Girth in Inches.	Cubic Contents.			Number.	Length.	Quarter Girth in Inches.	Cubic Contents.			Number.	Length.	Quarter Girth in Inches.	Cubic Contents.		
	FT.		C.FT.	IN.	P.		FT.		C.FT.	IN.	P.		FT.		C.FT.	IN.	P.
1	40	8¾	21	3	2	22	65	8¼	30	8	7	43	80	10	55	6	8
2	70	9	39	4	6	23	60	8	26	8	0	44	55	6	13	9	0
3	70	7½	27	4	1	24	25	6½	7	4	0	45	70	9	39	4	6
4	70	10¾	56	2	1	25	60	7¼	21	10	9	46	70	8¼	33	1	0
5	75	10	52	1	0	26	60	7	20	5	0	47	55	6¼	14	11	0
6	70	8¼	35	1	5	27	62	10½	45	0	10	48	60	7½	23	5	2
7	70	10	48	7	4	28	50	6¾	15	9	10	49	70	9½	43	10	5
8	70	9¾	46	2	6	29	75	9¼	44	6	9	50	45	6¼	12	2	5
9	80	10	55	6	8	30	75	7½	29	3	6	51	75	10	52	1	0
10	58	6¾	18	4	2	31	60	6½	17	7	2	52	70	8	31	1	4
11	80	10¾	64	2	4	32	70	9	39	4	6	53	50	5¼	9	6	10
12	60	7	20	5	0	33	70	9½	43	10	5	54	75	8½	37	7	6
13	75	11¾	71	10	10	34	80	10¾	64	2	4	55	30	8	13	4	0
14	75	7½	29	3	6	35	45	6	11	3	0	56	50	8½	23	1	0
15	70	8½	35	1	5	36	55	6½	16	1	7	57	60	8½	30	1	2
16	75	5¾	17	2	7	37	60	6¾	16	3	3	58	80	11	67	2	8
17	80	8½	40	1	7	38	70	10¾	56	2	1	59	70	8½	35	7	5
18	70	6½	20	6	5	39	75	7½	29	3	6	60	75	7½	29	3	6
19	70	6½	20	6	5	40	70	9½	43	10	5	61	70	8¼	33	1	0
20	65	8	29	2	4	41	65	9¼	38	7	5	62	75	11¾	65	11	0
21	75	6¾	23	8	9	42	60	6¼	16	3	3	63	70	9½	43	10	5
												64	50	8¼	23	7	7
														Total	2,140	3	10

Average ¼ girth = 8"½.

Average cubic contents = 33'-5.3.

APPENDIX C.

Contents of Half Acre in Plantation Elanyerry, 1845

Number	Length.	Quarter Girth in Inches.	Cubic Contents			Number.	Length.	Quarter Girth in Inches	Cubic Contents			Number.	Length	Quarter Girth in Inches.	Cubic Contents		
	FT		C FT	IN	P		FT		C FT	IN	P		FT		C FT	IN	P
1	45	5	7	9	9	27	60	7¼	21	10	9	53	30	6	7	6	0
2	70	8¼	33	1	0	28	75	11	63	0	0	54	70	9½	43	10	5
3	80	11¼	70	3	8	29	75	9½	47	0	0	55	50	6	12	6	9
4	65	7½	25	4	7	30	65	6½	19	0	9	56	40	6¾	12	7	10
5	70	8¼	33	1	0	31	75	9½	47	0	0	57	60	11¾	57	6	3
6	65	7½	25	4	7	32	70	5¾	16	0	10	58	65	8¼	30	8	7
7	75	11	63	0	3	33	35	6¼	9	5	11	59	70	10¼	45	0	11
8	75	9¼	44	6	9	34	40	5¾	9	2	2	60	45	6	11	3	0
9	75	10¾	60	2	3	35	80	10	55	6	8	61	45	6¼	12	2	5
10	65	7	22	1	5	36	70	8¼	33	1	0	62	80	8¾	42	6	4
11	60	6½	17	7	2	37	70	8	31	1	4	63	45	6	11	3	0
12	70	7	23	9	10	38	60	6¼	16	3	3	64	65	8¾	34	6	8
13	55	9¼	36	3	8	39	70	8¾	37	2	7	65	65	8¼	30	8	7
14	60	5	10	5	0	40	35	5½	7	4	2	66	80	12	80	0	0
15	50	5	8	8	2	41	70	8¾	37	2	7	67	70	8	31	1	4
16	75	6½	37	7	6	42	50	8¼	23	7	7	68	65	8½	32	7	3
17	45	5¼	8	7	4	43	70	9	39	4	6	69	70	9¼	41	7	1
18	50	5¾	11	5	9	44	70	9¾	46	2	6	70	50	5¼	13	6	9
19	75	11	63	0	0	45	65	8¼	30	8	7	71	35	6½	10	3	2
20	75	9	42	2	3	46	70	10½	53	7	1	72	65	8	28	10	8
21	40	5¼	9	2	2	47	70	8¾	37	2	7	73	65	9½	40	8	9
22	30	4¾	4	8	4	48	40	6	10	0	0	74	50	7½	19	6	4
23	57	4	6	4	1	49	65	8¼	30	8	7	75	40	6½	11	8	10
24	75	9¾	43	6	1	50	50	6¼	13	6	9	76	75	10¾	60	2	3
25	75	10	52	1	0	51	70	8¼	33	1	0	77	45	6½	13	2	5
26	50	5½	10	6	0	52	70	10	48	7	4	78	50	6½	14	8	0
												79	70	8¼	33	1	0
														Total ..	2,371	3	8

Average ½ girth = 7"¾ Average cubic contents = 30 0 2

Thirty only of the best out of the seventy-nine will be standing for maturity at about the year 1890

APPENDIX D.

Contents of Half Acre in Plantation Elanjerry, 1846

Number	Length.	Quarter Girth	Cubic Contents			Number.	Length	Quarter Girth.	Cubic Contents.			Number.	Length.	Quarter Girth	Cubic Contents.		
	FT.		C.FT.	IN	P.		FT.		C.FT.	IN	P.		FT.		C.FT	IN.	P.
1	70	8	31	1	4	27	40	4½	5	7	6	53	70	6¾	22	1	9
2	45	5⅛	9	5	5	28	50	5¼	9	6	10	54	60	7½	23	5	2
3	50	7½	19	6	4	29	75	10½	57	5	0	55	60	8	26	8	0
4	70	9¼	41	7	1	30	80	8¾	42	6	4	56	70	8½	35	1	5
5	65	7⅛	25	4	7	31	50	5¼	9	6	10	57	80	12	80	0	0
6	60	8½	30	1	2	32	55	6¾	17	4	9	58	80	9½	50	1	7
7	50	5	6	8	2	33	65	7½	25	4	7	59	70	8½	33	1	0
8	70	8¼	33	1	0	34	45	6	11	3	0	60	60	7	20	5	0
9	45	4¼	5	7	8	35	65	6¾	20	6	9	61	60	7½	23	5	2
10	70	9¾	46	2	6	36	60	6¾	18	11	9	62	45	5½	9	5	5
11	60	6½	17	7	2	37	60	6¼	16	3	3	63	60	8⅛	30	1	2
12	50	6	12	6	0	38	60	6	15	0	0	64	30	4⅛	3	9	1
13	60	7½	23	5	2	39	80	10¾	64	2	4	65	30	5	5	2	6
14	60	5¾	13	9	3	40	65	6¾	20	6	9	66	80	9½	50	1	7
15	65	6¾	20	6	9	41	75	9¼	47	0	0	67	75	9½	47	0	0
16	50	7	17	0	2	42	70	12¼	75	11	5	68	70	6½	20	6	5
17	70	7½	27	4	1	43	45	4¾	7	0	7	69	65	6¾	20	6	9
18	75	9½	47	0	0	44	70	8¼	33	1	0	70	50	4¾	7	10	0
19	70	7½	27	4	1	45	45	7	15	3	9	71	30	5	5	2	6
20	75	12¼	78	1	10	46	80	13½	101	2	11	72	70	8	31	1	4
21	75	9	42	2	3	47	30	5¾	6	10	7	73	45	5¼	8	7	4
22	70	6¾	22	1	9	48	30	5¼	6	8	10	74	70	11¼	61	6	3
23	70	9¾	46	2	6	49	70	9¼	43	10	5	75	70	7	23	9	10
24	70	8¼	33	1	0	50	50	6½	14	8	0	76	35	5	6	0	11
25	40	4½	5	7	6	51	70	7½	27	4	1	77	70	8	31	1	4
26	40	4¾	6	3	2	52	50	3¾	4	10	7	78	70	6	17	6	0
													Total	..	2,102	3	3

Average ¼ girth = 7"¼. Average cubic contents =26'-8-5.

APPENDIX E.

Contents of Half Acre in Plantation 1847, *Moolathamanoo*

Number	Length.	Quarter Girth	Cubic Contents			Number	Length	Quarter Girth	Cubic Contents			Number	Length.	Quarter Girth	Cubic Contents		
	FT		C FT	IN	P		FT		C FT	IN	P.		FT		C FT	IN	P
1	60	7½	23	5	2	25	66	9	37	1	6	48	65	6	16	3	0
2	60	6¾	18	11	9	26	75	8½	37	7	6	49	70	9¼	46	2	6
3	70	9¾	46	2	6	27	75	8½	37	7	6	50	65	6	16	3	0
4	45	5½	9	5	5	28	65	6	16	3	0	51	60	5¾	13	9	3
5	45	6½	18	2	5	29	60	10	41	8	0	52	35	5¼	6	8	4
6	40	6	10	0	0	30	80	9½	50	1	7	53	65	7¼	23	8	8
7	70	10½	53	7	1	31	80	10½	61	2	11	54	40	5½	8	4	10
8	75	9½	47	0	0	32	40	7	13	7	4	55	75	8½	37	7	6
9	70	7	23	9	10	33	55	6	13	9	0	56	50	7	17	0	2
10	50	6¾	15	9	10	34	50	5	8	8	2	57	50	7½	19	6	4
11	50	6	12	6	0	35	55	6	13	9	0	58	70	7½	27	4	1
12	75	10¼	54	8	7	36	65	6	16	3	0	59	56	6¾	17	8	7
13	60	8¼	28	4	3	37	60	5½	12	7	2	60	70	8¾	37	2	7
14	59	7¾	24	7	3	38	70	7	23	9	10	61	65	6	16	3	0
15	75	10¼	54	8	7	39	57	6	14	3	0	62	30	7	10	2	6
16	70	7½	27	4	1	40	70	6	17	6	0	63	70	9½	43	10	5
17	35	6	8	9	0	41	80	7½	31	2	11	64	75	9	42	2	3
18	70	8¾	37	2	7	42	55	5½	11	6	7	65	60	6¾	18	11	7
19	70	9	39	4	6	43	80	8	35	6	8	66	60	6¾	18	11	7
20	65	8½	32	7	3	44	65	7¼	23	8	8	67	50	6	12	6	0
21	65	7¼	23	8	8	45	45	7	15	3	9	68	75	11	63	0	3
22	50	6	12	6	0	46	75	9½	47	0	0	69	75	9½	47	0	0
23	75	7	22	1	5	47	70	9¾	46	2	6	70	30	4¼	3	9	1
24	75	7¼	27	4	6												
														Total ..	1,856	3	9

Average ½ girth = 7′ ½

Average cubic contents = 26′.3.2

APPENDIX F.

Contents of Half Acre in Plantation 1848, *Moolathamanoo.*

Number.	Length.	Quarter Girth.	Cubic Contents.			Number.	Length.	Quarter Girth.	Cubic Contents.			Number.	Length.	Quarter Girth.	Cubic Contents.		
	FT.		C.FT.	IN.	P.		FT.		C.FT.	IN.	P.		FT.		C.FT.	IN.	P.
1	50	6	12	6	0	27	70	7½	27	4	1	53	75	7½	29	3	6
2	80	7½	31	2	11	28	30	4¼	3	9	1	54	50	5¼	9	6	10
3	70	7¼	25	6	7	29	70	9½	43	10	5	55	40	6¼	10	10	2
4	50	7¾	20	10	3	30	60	8¼	28	4	3	56	70	7½	25	6	7
5	50	6¾	15	9	10	31	70	9¼	41	7	1	57	70	7¼	25	6	7
6	40	6¾	12	7	10	32	45	5	7	9	9	58	60	5½	12	7	2
7	45	4¾	7	0	7	33	60	7¼	21	10	9	59	70	7½	27	4	1
8	40	6¼	10	10	2	34	70	8¾	37	2	7	60	70	7¾	29	2	4
9	75	9¾	49	6	1	35	40	5¼	7	7	10	61	70	8½	35	1	5
10	75	6¼	20	1	1	36	65	7½	25	4	7	62	45	5½	9	5	5
11	70	7¾	29	2	4	37	45	7	15	3	9	63	50	5½	10	6	0
12	35	4½	4	11	0	38	50	6¼	13	6	9	64	70	7	23	9	10
13	65	7¼	23	8	8	39	50	7¼	18	3	0	65	65	6	16	3	0
14	70	5½	14	8	5	40	40	5¾	9	2	2	66	70	7	23	9	10
15	70	6	17	6	0	41	35	5¼	6	8	4	67	70	8¼	33	1	0
16	70	6¼	18	11	10	42	70	8¾	37	2	7	68	65	6	16	3	0
17	55	5	9	6	7	43	55	7¼	20	0	10	69	65	6¼	17	7	6
18	70	6¼	18	11	10	44	70	7½	27	4	1	70	45	5½	9	9	5
19	75	10	52	1	0	45	50	6¾	15	9	10	71	75	10¼	54	8	7
20	65	6½	19	0	9	46	60	6	16	0	0	72	60	6¼	16	3	3
21	70	6¼	18	11	10	47	50	5½	10	6	0	73	60	6¾	18	11	9
22	70	6	17	6	0	48	50	5¾	11	5	9	74	70	9¼	41	7	1
23	60	6	16	0	0	49	70	6¼	18	11	10	75	30	7¼	10	11	4
24	50	4¾	7	10	0	50	65	7	22	1	5	76	75	8¾	39	10	6
25	60	5¾	13	9	3	51	50	5¾	11	5	9	77	60	5½	12	7	2
26	65	6½	19	0	9	52	75	7½	29	3	6	78	65	7½	25	4	7
														Total ..	1,621	9	6

Average ¼ girth = 7″¾.

Average cubic contents = 20′.7.

APPENDIX G.

Contents of Half Acre in Plantation 1858, *Elanjerry*

Number	Length	Quarter Girth	Cubic Contents			Number	Length	Quarter Girth	Cubic Contents			Number	Length	Quarter Girth	Cubic Contents		
	FT		C FT	IN	P		FT		C FT	IN	P		FT		C FT	IN	P
1	45	6	11	3	0	46	45	4	5	0	0	91	45	6½	13	2	5
2	45	4¼	5	7	8	47	45	4½	6	3	11	92	45	5	7	9	9
3	45	5¾	10	3	11	48	45	7	15	3	9	93	45	6	11	3	0
4	45	5¾	10	3	11	49	45	5¾	10	3	11	94	45	6¼	12	2	5
5	45	5¼	8	7	4	50	45	3	2	9	9	95	45	6½	13	2	5
6	45	7	15	3	9	51	45	4¼	5	7	8	96	45	4¼	5	7	8
7	45	3¼	3	9	11	52	45	4¼	7	0	7	97	45	4½	6	3	11
8	45	4¼	5	7	8	53	45	6¾	14	2	10	98	45	6	11	3	0
9	45	6¼	12	2	5	54	45	6¾	14	2	10	99	45	4¾	7	0	7
10	45	3½	3	9	11	55	45	4½	6	3	11	100	45	6	11	3	0
11	45	5	7	9	9	56	45	5	7	9	9	101	45	4¼	5	7	8
12	45	3	2	9	9	57	45	4	5	0	0	102	45	3¾	4	4	8
13	45	3¾	4	4	8	58	45	5¼	8	7	4	103	45	6	11	3	0
14	45	6¼	13	2	5	59	45	6¼	12	2	5	104	45	5¼	8	7	4
15	45	4¾	7	0	7	60	45	4	5	0	0	105	45	3¾	4	4	8
16	45	4½	6	3	11	61	45	5½	9	5	5	106	45	4½	6	3	11
17	45	5¼	8	7	4	62	45	5	7	9	9	107	45	5	7	9	9
18	45	5¼	8	7	4	63	45	6	11	3	0	108	45	3¾	4	4	8
19	45	4½	6	3	11	64	45	5¾	10	3	11	109	45	4	5	0	0
20	45	6	11	3	0	65	45	7¼	16	5	1	110	45	3¾	4	4	8
21	45	3¼	3	3	7	66	45	4	5	0	0	111	45	6¼	12	2	5
22	45	6½	13	2	5	67	45	6½	13	2	5	112	45	3¾	4	4	8
23	45	4¼	5	7	8	68	45	6	11	3	0	113	45	3¾	4	4	8
24	45	4½	6	3	11	69	45	3¾	4	4	8	114	45	5¼	8	7	4
25	45	5½	9	5	5	70	45	5¾	10	3	11	115	45	5¼	8	7	4
26	45	4¼	6	3	11	71	45	4	5	0	0	116	45	4¾	7	0	7
27	45	3	2	9	9	72	45	3¼	3	3	7	117	45	6	11	3	0
28	45	3¾	4	4	8	73	45	6½	13	2	5	118	45	5¼	8	7	4
29	45	5¼	8	7	4	74	45	6½	13	2	5	119	45	5	7	9	9
30	45	5	7	9	9	75	45	3¾	4	4	8	120	45	4¼	5	7	8
31	45	7	15	3	9	76	45	4¼	5	7	8	121	45	4½	6	3	11
32	45	3½	3	9	11	77	45	4	5	0	0	122	45	6	11	3	0
33	45	3½	3	9	11	78	45	7	15	3	9	123	45	6¼	12	2	5
34	45	5½	9	5	5	79	45	3¾	4	4	8	124	45	6	11	3	0
35	45	4½	6	3	11	80	45	6¼	12	2	5	125	45	5	7	9	9
36	45	5	7	9	9	81	45	6¼	12	2	5	126	45	4¾	7	0	7
37	45	4½	6	3	11	82	45	3½	3	9	11	127	45	6	11	3	0
38	45	5	7	9	9	83	45	4	5	0	0	128	45	5	7	9	9
39	45	4	5	0	0	84	45	5¼	8	7	4	129	45	5	7	9	9
40	45	6	11	3	0	85	45	3¾	4	4	8	130	45	4¼	5	7	8
41	45	6½	13	2	5	86	45	4¾	7	0	7	134	45	4¼	5	7	8
42	45	3¼	3	3	7	87	45	4½	6	3	11	132	45	5¼	10	3	11
43	45	7¼	16	5	1	88	45	7¼	16	5	1	133	45	4¾	6	3	11
44	45	6¼	12	2	5	89	45	4	5	0	0	131	45	5¼	8	7	4
45	45	3¾	4	4	8	90	45	4	5	0	0	135	45	3¾	4	4	8
														Total ..	1,101	4	9

Average ½ girth = 3 $\frac{5}{11}$ Average cubic contents = 8.1.10

APPENDIX H.

Contents of Half Acre in Plantation 1868, Wallashary

Number	Length	Quarter Girth.	Cubic Contents				Number	Length	Quarter Girth	Cubic Contents				Number.	Length.	Quarter Girth.	Cubic Contents			
	FT		C	FT	IN	P		FT		C	FT	IN	P		FT		C	FT	IN	P
1	40	5	6	11	4		65	40	2¾	2	1	2		129	40	3¾	3	10	10	
2	40	3½	3	4	10		66	40	4½	5	7	6		130	40	2½	1	8	10	
3	40	3¾	3	10	10		67	40	3½	3	4	10		131	40	3¾	3	10	10	
4	40	2½	2	1	2		68	40	3	2	6	0		132	40	2½	1	8	10	
5	40	3¾	3	10	10		69	40	4¼	5	0	2		133	40	4¼	5	0	2	
6	40	3½	3	4	10		70	40	5	6	11	4		134	40	2½	1	8	10	
7	40	5	6	11	4		71	40	3¾	3	10	10		135	40	5	6	11	4	
8	40	2	1	1	4		72	40	2¾	2	1	2		136	40	2½	1	8	10	
9	40	2½	1	4	10		73	40	2½	1	8	10		137	40	2½	1	8	10	
10	40	3¼	2	11	2		74	40	3	2	6	0		138	40	4¼	5	0	2	
11	40	2½	1	8	10		75	40	2½	1	8	10		139	40	3¼	2	11	2	
12	40	2	1	1	4		76	40	3¾	3	10	10		140	40	2½	1	8	10	
13	40	3¼	2	11	2		77	40	3	2	6	0		141	40	3	2	6	0	
14	40	3½	3	4	10		78	40	3	2	6	0		142	40	2½	1	8	10	
15	40	4	4	5	4		79	40	3¼	2	11	2		143	40	3½	3	4	10	
16	40	3	2	6	0		80	40	4	4	5	4		144	40	3	2	6	0	
17	40	3¾	3	10	10		81	40	3¼	2	11	2		145	40	4¼	5	0	2	
18	40	4	4	5	4		82	40	3½	3	4	10		146	40	2½	1	8	10	
19	40	3¾	3	10	10		83	40	2½	1	8	10		147	40	2¼	1	8	10	
20	40	3	2	6	0		84	40	3	2	6	0		148	40	5	6	11	4	
21	40	3¼	3	4	10		85	40	2½	1	8	10		149	40	2½	1	8	10	
22	40	2¼	1	8	10		86	40	4	4	5	4		150	40	4¼	5	0	2	
23	40	3¾	3	10	10		87	40	2½	1	8	10		151	40	3	2	6	0	
24	40	3¾	3	10	10		88	40	2½	0	8	10		152	40	4¾	6	3	2	
25	40	3	2	6	0		89	40	4¾	6	3	2		153	40	2½	1	8	10	
26	40	2¼	1	4	10		90	40	3¼	3	10	10		154	40	2½	1	8	10	
27	40	3	2	6	0		91	40	4¼	5	0	2		155	40	3¼	2	11	2	
28	40	3	2	6	0		92	40	4¼	5	0	2		156	40	5½	8	4	10	
29	40	2½	1	8	10		93	40	2½	1	8	10		157	40	5	6	11	4	
30	40	3¼	2	11	2		94	40	4¾	6	3	2		158	40	3¼	2	11	2	
31	40	2½	1	8	10		95	40	3¼	2	11	2		159	40	3	2	6	0	
32	40	3	2	6	0		96	40	6¼	10	10	2		160	40	3¼	2	11	2	
33	40	4	4	5	4		97	40	2½	1	8	10		161	40	5	6	11	4	
34	40	3	2	6	0		98	40	4	4	5	4		162	40	3	2	6	0	
35	40	2	1	1	4		99	40	3	2	6	0		163	40	3¼	2	11	2	
36	40	2¼	1	4	10		100	40	3¾	3	10	10		164	40	3	2	6	0	
37	40	3	2	6	0		101	40	2½	1	8	10		165	40	4	4	5	4	
38	40	3¼	2	11	2		102	40	4½	5	7	6		166	40	3¼	2	11	2	
39	40	3½	3	4	10		103	40	2½	1	8	10		167	40	3	2	6	0	
40	40	2½	1	8	10		104	40	3¼	3	10	10		168	40	4	4	5	4	
41	40	3	2	6	0		105	40	3¾	3	10	10		169	40	4	4	5	4	
42	40	2½	1	8	10		106	40	2½	1	8	10		170	40	4	4	5	4	
43	40	2	1	1	4		107	40	3¾	3	10	10		171	40	2½	1	8	10	
44	40	2¾	2	1	2		108	40	5¼	7	7	10		172	40	5	6	11	4	
45	40	4¾	6	3	2		109	40	4	4	5	4		173	40	3½	3	4	10	
46	40	2½	1	8	10		110	40	2¾	2	1	2		174	40	2½	1	8	10	
47	40	2½	1	8	10		111	40	3¼	2	11	2		175	40	2½	1	8	10	
48	40	2	1	1	4		112	40	4¼	5	0	2		176	40	5	6	11	4	
49	40	2¾	2	1	2		113	40	2½	1	8	10		177	40	3¾	3	10	10	
50	40	3½	3	4	10		114	40	3	2	6	0		178	40	3	2	6	0	
51	40	4¼	5	0	2		115	40	5¼	7	7	10		179	40	3	2	6	0	
52	40	2½	1	8	10		116	40	2½	1	8	10		180	40	2½	1	8	10	
53	40	2½	1	8	10		117	40	2½	1	8	10		181	40	2½	1	8	10	
54	40	2¾	2	1	2		118	40	3	2	6	0		182	40	3¼	2	11	2	
55	40	2½	1	8	10		119	40	4¼	5	0	2		183	40	2½	1	8	10	
56	40	3	2	6	0		120	40	2½	2	1	2		184	40	2½	1	8	10	
57	40	4¼	5	0	2		121	40	2½	1	8	10		185	40	3¼	2	11	2	
58	40	3¼	2	11	2		122	40	4¼	5	0	2		186	40	3	2	6	0	
59	40	3½	3	4	10		123	40	5	6	11	4		187	40	4¾	6	3	2	
60	40	3	2	6	0		124	40	2½	1	8	10		188	40	2½	1	8	10	
61	40	4	4	5	4		125	40	2¾	1	8	10		189	40	3¼	3	10	10	
62	40	4½	5	0	2		126	40	3¼	2	11	2		190	40	3	2	6	0	
63	40	3	2	6	0		127	40	3	2	6	0		191	40	3	2	6	0	
64	40	3¾	3	10	10		128	40	2½	1	8	10		192	40	3	2	6	0	

APPENDIX H—(*Continued*).

Contents of Half Acre in Plantation 1868, Wallashary

Number	Length	Quarter Girth	Cubic Contents			Number	Length	Quarter Girth	Cubic Contents			Number	Length	Quarter Girth	Cubic Contents		
	FT		C FT	IN.	P		FT		C FT	IN	P		FT		C FT	IN	P
193	40	3½	3	4	10	254	40	3¾	3	10	10	315	40	3¼	2	11	2
194	40	3¾	3	10	10	255	40	3	2	6	0	316	40	2¾	2	1	2
195	40	5	6	11	4	256	40	4	4	5	4	317	40	3	2	6	0
196	40	2¾	1	8	10	257	40	4½	5	7	6	318	40	3	2	6	0
197	40	3½	3	4	10	258	40	3	2	6	0	319	40	5½	8	4	10
198	40	4¾	6	3	2	259	40	5¾	9	2	2	320	40	2½	1	8	10
199	40	2¾	2	1	2	260	40	3¼	3	10	10	321	40	3¼	2	11	2
200	40	2¼	2	1	2	261	40	5	6	11	4	322	40	3	2	6	0
201	40	3	2	6	0	262	40	3½	3	4	10	323	40	3¾	3	10	10
202	40	3½	3	4	10	263	40	3	2	6	0	324	40	3½	3	4	10
203	40	3	2	6	0	264	40	3½	3	4	10	325	40	3	2	6	0
204	40	3¼	2	11	2	265	40	3¼	2	11	2	326	40	2¾	2	1	2
205	40	2¼	1	8	10	266	40	3	2	6	0	327	40	2½	1	8	10
206	40	4½	5	7	6	267	40	3¼	3	4	10	328	40	3¼	2	11	2
207	40	4	4	5	4	268	40	2½	1	8	10	329	40	2½	1	8	10
208	40	3	2	6	0	269	40	2¾	2	1	2	330	40	5	6	11	4
209	40	4½	5	7	6	270	40	3½	3	4	10	331	40	2½	1	8	10
210	40	2½	1	8	10	271	40	3¼	2	11	2	332	40	4¼	5	0	2
211	40	3½	3	4	10	272	40	2¾	2	1	2	333	40	3	2	6	0
212	40	2¼	2	1	2	273	40	2½	1	8	10	334	40	3	2	6	0
213	40	3¼	2	11	2	274	40	3	2	6	0	335	40	3	2	6	0
214	40	2¼	2	1	2	275	40	3¼	2	11	2	336	40	2½	1	8	10
215	40	3	2	6	0	276	40	2½	1	8	10	337	40	4¼	5	0	2
216	40	4¼	5	0	2	277	40	2½	1	8	10	338	40	2½	1	8	10
217	40	2½	1	8	10	278	40	5	6	11	4	339	40	5	6	11	4
218	40	3	2	6	0	279	40	4	4	5	4	340	40	4¼	5	0	2
219	40	4¼	5	0	2	280	40	3¼	2	11	2	341	40	3¼	2	11	2
220	40	3	2	6	0	281	40	3¾	3	10	10	342	40	2½	1	8	10
221	40	3¼	2	11	2	282	40	3¼	2	11	2	343	40	4¼	5	0	2
222	40	2¼	1	8	10	283	40	2½	1	8	10	344	40	2½	1	8	10
223	40	5	6	11	4	284	40	3½	3	4	10	345	40	2¾	2	1	2
224	40	4¼	5	0	2	285	40	4¼	5	0	2	346	40	2¾	2	1	2
225	40	3	2	6	0	286	40	3	2	6	0	347	40	6½	11	8	10
226	40	3	2	6	0	287	40	4¼	5	7	6	348	40	3	2	6	0
227	40	3½	3	4	10	288	40	2¼	1	8	10	349	40	3½	3	4	10
228	40	3½	3	4	10	289	40	3	2	6	0	350	40	2½	1	8	10
229	40	3¼	3	10	10	290	40	4	4	5	4	351	40	3¼	2	11	2
230	40	2½	1	8	10	291	40	4½	5	7	6	352	40	8	6	11	4
231	40	2¾	2	1	2	292	40	2¼	1	8	10	353	40	4¼	5	0	2
232	40	3¼	3	10	10	293	40	2½	1	8	10	354	40	2½	1	8	10
233	40	2¼	2	1	2	294	40	3½	3	4	10	355	40	3	2	6	0
234	40	2½	1	8	10	295	40	3	2	6	0	356	40	4¼	5	0	2
235	40	3¾	3	10	10	296	40	3½	3	4	10	357	40	2½	1	8	10
236	40	3	2	6	0	297	40	4¼	5	0	2	358	40	4¼	5	7	6
237	40	3¼	2	11	2	298	40	2½	1	8	10	359	40	4¾	6	3	2
238	40	3¾	3	10	10	299	40	3	2	6	0	360	40	3	2	6	0
239	40	3¼	3	10	10	300	40	2¼	1	8	10	361	40	4¼	5	0	2
240	40	3	2	6	0	301	40	4	4	5	4	362	40	3	2	6	0
241	40	3¾	3	10	10	302	40	2½	1	8	10	363	40	2½	1	8	10
242	40	4¼	5	0	2	303	40	3¼	3	4	10	364	40	3¼	2	11	2
243	40	3¼	2	11	2	304	40	3¼	2	11	2	365	40	4¼	5	0	2
244	40	4¼	5	0	2	305	40	3¾	3	10	10	366	40	2½	1	8	10
245	40	3¼	2	11	2	306	40	3¼	2	11	2	367	40	2¾	2	1	2
246	40	2½	1	8	10	307	40	4	4	5	4	368	40	3	2	6	0
247	40	3	2	6	0	308	40	3	2	6	0	369	40	3¼	2	11	2
248	40	4¼	5	0	2	309	40	3¾	3	10	10	370	40	4¼	5	0	2
249	40	4	4	5	4	310	40	3¼	2	11	2	371	40	3	2	6	0
250	40	2½	1	8	10	311	40	5	6	11	4	372	40	4	4	5	4
251	40	3	2	6	0	312	40	3½	3	4	10	373	40	5	6	11	4
252	40	4½	5	7	6	313	40	3	2	6	0	374	40	2½	1	8	10
253	40	2¾	2	1	2	314	40	5	6	11	4	375	40	3¾	2	11	2
														Total	1,245	6	4

Average ¼ girth = 3″ 1/16 Average cubic contents = 3.2.11

APPENDIX I.

Register of Areas planted yearly from 1840 to 1876.

No.	Year planted and local Name of Plantation.	Planted and Surveyed Acres.	Not Planted	Total Area in Acres.
1	Iravelly Kava, 1842	30·93		
2	Do. 1844	27·35		
3	Do. 1852	38·57		
4	Do. 1853	34·71		
5	Arevakode, 1847	29·29		
6	Do. 1848	84 34		
	Total ..	245·19		
7	Yedacode, 1844	30·65		
8	Do. 1845	28·14		
9	Do. 1846	44·78		
10	Do. 1847	54·61		
11	Do. 1848	82·15		
12	Do. 1849	44·58		
13	Do. 1850	49·67		
14	Do. 1851	147·19		
15	Do. 1857	36·14		
16	Do. 1860	39·56		
17	Do. 1861	86·05		
18	Do. 1862	50·11		
	Total ..	693·63		
19	Elanjerry, 1845	33·19		
20	Do. 1846	65·84		
21	Do. 1849	89·95		
22	Do. 1850	66·15		
23	Do. 1858	42 79		
24	Do. 1859	39·84		
	Total ..	337·76		
25	Ramalur, 1844	4·93		
26	Do 1850	16·40		
	Total ..	21·33		
27	Moolathamanoo, 1847	34·63		
28	Do. 1848	16·04		
29	Do. 1853	20·89		
	Total ..	71 56		
	Total of Nelambur Block ..	1369·47	3831·09	5200·56
30	Pannengode, 1854	92·33		
31	Do. 1855	100 32		
32	Do. 1856	79 26		
33	Do. 1863	81 25		
34	Do. 1864	40·57		
	Total ..	393 73	511·43	905 16

APPENDIX I—(*Continued*).

Register of Areas planted yearly from 1840 *to* 1876—(Continued).

No.	Year planted and local Name of Plantation.	Planted and Surveyed Acres.	Not Planted	Total Area in Acres
35	Wallashary, 1864	81·14		
36	Do. 1865	56 63		
37	Do. 1866	32 30		
38	Do. 1866	96·34		
39	Do. 1867	41·31		
40	Do. 1867	77·32		
41	Do. 1868	33·94		
42	Do. 1868	79·08		
43	Do. 1868	32·38		
44	Do. 1869	89·36		
45	Do. 1869	14·20		
	Total ..	584·00	348·20	932·20
46	Chathumbudovoi, 1872 ..	207·56		
47	Do. 1873 ..	99·08		
48	Do. 1874 ..	91·46		
49	Do. 1875 ..	100·00		
	Total ..	498·10	201·42	699·52
50	Nollicottah, 1870	74·23		
	Do. 1871	46·00		
	Total ..	120·23	1703·90	1824 13
51	Amrapolliam, 1861-68 ..	87·44		
52	Do. 1873	42·39		
53	Do. 1874	69·03		
54	Do. 1875	60·91		
55	Do. 1876	149·00		
	Total ..	408 77	65·46	474·23
56	Mangalashary	10·74		
57	Amblakandy	1·01		
58	Mangalashary	19·58		
59	Chittarikal	8·35		
60	Patalathoo			
61	Arinbrakullamala	22·00		
	Total ..	61·68	299·75	361·43
	Total ..	3435·98	6961·25	10397·23
	Add Karimpoya and other Blocks in which there are no plantations (*Vide* Appendix J).	..	8472·46	..
	Grand Total ..	3435 98	15433·71	18869·69

APPENDIX J.

Register of Surveyed Areas of Natural Forest and Teak Plantations in the several Blocks comprising the Nelambur Forest Division.

No.	Name of Forest Blocks.	No of Acres Planted.	No. of Acres not Planted	Total Acres in each Block.
1	Nelambur	1369·47	3831·09	5200·56
2	Pannengode	393 73	511·43	905·16
	Wallashary	584·00	348·20	932·20
	Pokode	..	761·25	761·25
3	Kanakutta	..	668·61	668·61
4	Chathumbudovoi ..	498·10	201 42	699·52
5	Eddumbadum	..	381 26	381·26
6	Mooriam	..	1765·13	1765·13
7	Karien	..	950·61	950·61
8	Nellicottah	120 23	1703 90	1824·13
9	Karimpoya	..	3945·60	3945·60
10	Amrapolliam	408 77	65·46	474·23
11	Arimbracuttamala ..	22·00	299 75	321·75
12	Amblakandi	1·01	..	1·01
13	Manglashary (Ernad)..	10·74	..	10·74
14	Manglashary (Calicut)..	19·58	..	19·58
15	Puthulathoo	8·35	..	8·35
	Chitarikel			
	Grand Total ..	3435·98	15433 71	18869 69

REFERRED for remark by the Board of Revenue who, with the information now furnished, will be in a position to check the calculations in their Proceedings,* dated 16th June 1877, No. 2,828.

* G.O., 15th August 1877, No. 2,505.

OOTACAMUND,
27th June 1878.

(Signed) C. G. MASTER,
Secretary to Government.

From W. LOGAN, Esq., Collector of Malabar, to C. A. GALTON, Esq., Acting Secretary to the Board of Revenue, dated Calicut, 16th September 1878, with reference to Board's Official Memorandum, dated 16th August 1878, No. 969.

MEMORANDUM of the Gross Receipts and Charges of all kinds of the Nelambur Teak Plantations from 1840-41 to 1861-62.

Years.	Receipts.			Charges.			Years.	Receipts.			Charges.		
	RS.	A.	P.	RS.	A.	P.		RS.	A.	P.	RS.	A.	P.
1840-41 ...	...			8,450	0	0	1852-53 ...	4,785	12	9	4,542	2	8
1841-42 ...	...			2,810	13	0	1853-54 ...	538	2	2	3,158	10	11
1842-43 ...	475	7	8	1,766	1	0	1854-55 ...	503	0	2	3,284	0	11
1843-44 ...	..			2,097	13	8	1855-56 ...	299	8	5	2,870	4	2
1844-45 ..	12	14	0	2,323	6	4	1856-57 ...	257	8	0	3,194	14	0
1845-46 ...	...			2,909	5	0	1857-58 ...	854	3	1	2,938	11	3
1846-47 ...	...			3,135	15	0	1858-59 ...	1,768	13	6	2,348	10	10
1847-48 ...	...			3,228	12	11	1859-60 ...	5,717	2	9	3,935	7	1
1848-49 ...	767	1	8	3,217	14	7	1860-61 ...	4,615	6	8	2,907	4	7
1849-50 ...	427	0	0	3,183	13	11	1861-62 ...	808	0	0	3,779	5	6
1850-51 ...	444	8	5	3,438	3	1							
1851-52 ...	819	2	6	2,834	15	1	Total ...	23,093	11	9	72,356	9	6

THE Board resubmit to Government Colonel Beddome's valuable report upon the Nelambur Teak Plantations. It is replete with statistical information obtained with obvious labor and brought together with care.

2. Colonel Beddome has classified the soils of the whole plantation as alluvial, gneiss and laterite, and the anticipated yield per acre as full $\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{4}$ or Nil.

3. Before summarizing results he has noted observations in detail for each block of plantation, commencing from the 1842 plantation and then from 1844 annually till 1876 inclusive. These detailed notes will form a valuable record to future foresters and should be renewed every five or ten years.

4. The general result observed is (paragraph 49 *et seq.*) that the trees which had been growing in height till about thirty years of age are now swelling in stem, and the system of culture is shown to produce a length and straightness of boll out of all proportion to the growth in the natural forests, and the older plantations have made such a wonderful growth in bulk as to entirely dispel all the Conservator's previous doubts. That they grow with increased rapidity as their age advances is satisfactorily exemplified in the remarks under girth, paragraph 85. It is anticipated that the trees will have arrived at maturity when about sixty years old, and that they should then stand about sixty trees in an acre.

5. In paragraph 75 the legal question is broached as likely to be raised as to what is a mature tree, and when the stump fee payment thereon should commence, certain lessors having already advanced such claims on felled saplings, and Colonel Beddome recommends that saplings girthing 6 feet at 6 feet from the bottom should for this purpose be considered a matured tree on which the stump fee on felling is due under the terms of the agreement. The Board have not a copy of the agreement to refer to, but from what Colonel Beddome says they do not think that the legal position requires any such concession. The original agreement evidently pointed to the lessor sharing in the profits of felling matured trees when the lessee considered and felled them as such. The question is, when are they mature? It is reported that they are mature at about sixty years of age. Any tree felled after that age would come within the terms of the agreement. It is for the Government to decide whether it will keep to this view of the agreement and refuse and remit to the Law Courts all earlier claims for stump fees, or will accept Colonel Beddome's more liberal compromise.

6. In paragraph 58 Colonel Beddome gives statements showing all expenditure and all receipts up to date, following a different plan from that adopted by Mr. Macgregor, who eliminated all receipts and charges not *directly* connected with the planting operations. The Board consider Colonel Beddome's the more correct course to follow in determining the financial position of the Nelambur plantations taken as a whole. The cost of planting was clearly enhanced by the outlay on the purchase and clearing of land, and the receipts from the sale of timber felled on this land, whether when clearing for planting purposes or at any other time, form a fair set-off against the expenditure so incurred. In the statement submitted by Colonel Beddome no details are shown prior to 1862, and the information given was thus not sufficient to enable the Board to calculate the debt against the plantations at 4 per cent. compound interest. A little delay has consequently taken place in making a reference to the Collector. From the figures received from him and those given by Colonel Beddome, the Board calculate the total debt inclusive of all charges, and accumulated at 4 per cent. compound interest, at Rupees 3,77,827..

7. In making his calculations with regard to profits Colonel Beddome has assumed that when the existing plantations are felled over, there will be 3435·98 acres equal to 2,484¾ acres yielding a full crop of sixty trees containing on an average 100 cubic feet of marketable timber How modest this average is may be gathered from the fact that mature trees are supposed to be not less than sixty years old, while Colonel Beddome's notes show that in one of the two half-acres examined in a plantation put down only thirty-four years ago, two trees already carry more than 100 cubic feet.

The price which the timber is likely to realize is similarly calculated at what may be called the minimum rate of 10 Annas per cubic foot net profit as it stands in the plantation (*vide* paragraphs 97-99).

8. Adopting these rates, which are certainly not open to objection on the ground of being over-sanguine, and assuming that the felling will be spread tolerably equally over a period of eighty-two years, viz., from 1904 to 1986, as proposed in paragraph 96, the amount annually felled may be taken at 183,000 cubic feet, the net profit whereon will be Rupees 1,14,375. Colonel Beddome anticipates (paragraph 100) that the debt with interest may be paid off from the profits from the thinnings before the regular felling commences, but as it would require an annual profit of Rupees 23,640 to pay off a debt of Rupees 3,77,827 with interest at 4 *per cent.* in twenty-six years, and as there are no data whatever on which a reliable estimate can be framed of the profits from this head, it will be simpler, for the present, merely to consider what the profits will be, on the assumption (which certainly falls far within the mark) that the thinnings will realize enough to cover all annual expenses.

9. As above said, when felling commences there will be an average annual profit of Rupees 1,14,375 for eighty-two years commencing in 1904. Now the present value of an annuity of Rupees 1,14,375 with interest at 4 per cent. for a period of eighty-two years, commencing twenty-six years hence, is Rupees 9,89,972, to set off against which there is a debt of no more than Rupees 3,77,827.

To put it another way, when the felling is completed in 1986 the accumulated annual profit of Rupees 1,14,375 at 4 per cent. will have amounted to Rupees 6,84,26,780, while the debt, accumulating at the same rate of interest, will be only Rupees 2,61,14,960, leaving a profit of Rupees 4,23,11,820.

10. When it is remembered that the above results have been arrived at by assuming a very low rate of profit per cubic foot, a very small outturn per acre, and that the felling will be spread over an unnecessarily long period, the Board are convinced that it is not possible, even to the most despondent mind, to take a gloomy view of the financial position of the Nelambur plantations.

11. The forecast of the financial results would have been even more strikingly favorable if the Amrapolliam and Karampoya blocks had been excluded from consideration, as the debt against the plantations has been greatly swelled by the outlay of Rupees 80,000 for the purchase of these blocks, while only 408·77 acres have been planted up. In paragraph 110 Colonel Beddome remarks that the accounts of these blocks are kept distinct from Nelambur, and the Board concur with him in considering that they should continue to be kept distinct under the head of the Amrapolliam extension.

12. In paragraph 103 Colonel Beddome discusses the question of the extension of planting and considers that, with the certainty of 180,000 cubic feet at least, and probably much more, available for felling every year for eighty years after 1904, all the services of the establishment should be employed in the up-keep and improvement of the present plantations—planting not beginning again till about 1900. If the felling of the timber already planted is not to be completed till 1986, it would probably be advisable to deter further planting as proposed, but the Board are not sure that it will be wise to act on this assumption, involving as it does the decision that it will be expedient to leave some of the trees standing until they are about 110 years old. From paragraph 78 it appears that both Colonel Beddome and Mr. Ferguson are of opinion that at about sixty or seventy years of age the trees on the best soil will be large marketable timber, and though it seems probable that they will go on improving for many years after that, there is no question that, as remarked by the Conservator, it will be more profitable as a rule to fell them when they reach a good marketable size. Such being the case, the Board would recommend the continuance of planting operations as regards the 430 acres of good alluvial soil referred to in paragraph 104, but there seems no reason to continue it under the adverse circumstances reported with regard to the Nellicootah, Eddiambodum and Karampoya blocks, which may with advantage be merely fire-traced and treated as natural reserve as recommended by Colonel Beddome in paragraphs 105 and 106. They also support his proposal in paragraph 109 that he should be supplied with a quantity of Mahogany seed.

13. The proposal in paragraph 113 that all Forest Officers who have anything to do with teak plantations should be allowed to visit Nelambur and spend a fortnight or three weeks in going through the plantations commends itself strongly to the Board, and they consider that Rupees 4,000 will be well laid out on the construction of a new building to permit of the utilization of the advantages offered by Nelambur as a school of forestry.

14. The proposal in paragraph 116 for the selection of a new forester has the Board's support, and they would commend Mr. Ferguson's pensionary claims to the liberal consideration of Government.

(A true Copy and Extract.)

(Signed) J. STURROCK,
Acting Sub-Secretary.

From Lieutenant-Colonel R. H. BEDDOME, Conservator of Forests, to C. G. MASTER, Esq., Secretary to Government, Revenue Department, dated Ootacamund, 1st November 1878, No. 1,169.

As a supplement to my report on the Nelambur Teak Plantations, I have the honor to forward a list giving the one-fourth girth and cubical contents of each of the saplings cut for the Paris Exhibition in 10-feet sections from the base up, as Dr. Brandis has suggested to me that this will give interesting and valuable data as to the tapering and the one-fourth girth at breast high and half length.

2. I also annex a statement showing the one-fourth girth at breast high and half length of a few standing trees taken in groups without selection in the centre and at the outside of our oldest plantation.

3. The one-fourth girth at half length with reference to measurements at breast high varies considerably in different trees, and more so than I expected; but Mr. Ferguson is of opinion that in well-grown trees the difference is only one-sixth part or 16⅔ per cent.

ENCLOSURE No. 1.

REVISED LIST of the remaining portions of the Specimens forwarded to Paris Exhibition showing Contents in Sections of 10-feet length.

Year planted.	Specimen Number.	Section Number.	Length in Feet.	One-fourth Girth in Inches.	Contents of each Section.	Total Contents of each Tree.	Original Contents of each Tree as sent to Paris Exhibition.
1844 ...	1	1	10	15	15 7 6		
		2	10	14½	14 1 2		
		3	10	13	11 8 10		
		4	10	12½	10 5 0		
		5	10	11½	9 2 2		
		6	10	9½	6 3 2		
		7	10	8	4 5 4		
Total ...	...	.	...	...		71 9 2	72 11 4

Revised List of the remaining portions of the Specimens forwarded to Paris Exhibition, &c.—(*Continued*).

Year planted.	Specimen Number.	Section Number.	Length in Feet.	One-fourth Girth in Inches.	Contents of each Section.	Total Contents of each Tree.	Original Contents of each Tree as sent to Paris Exhibition.
1845	2	1	10	14½	14 7 2		
		2	10	13¾	13 1 6		
		3	10	12¾	11 3 5		
		4	10	11½	9 2 2		
		5	10	10	6 11 4		
		6	10	8	4 5 4		
Total	.	...	...	...	...	59 6 11	60 0 0
1846	6	1	10	15	15 7 6		
		2	10	14	13 7 4		
		3	10	13	11 8 10		
		4	10	12	10 0 0		
		5	10	11	8 4 10		
		6	10	10	6 11 4		
		7	12	9	5 7 6		
Total	...	...	...	.	...	71 11 4	69 0 4
1847 ..	4	1	10	17½	21 3 2		
		2	10	16¾	17 2 8		
		3	10	14¾	15 7 8		
		4	10	14	13 7 4		
		5	10	13¾	11 3 5		
		6	10	17	8 4 10		
		7	10	9½	6 3 2		
Total			...	...	. .	93 1 10	102 2 5
1848	5	1	10	12½	10 10 2		
		2	10	11½	9 2 2		
		3	10	10½	7 7 10		
		4	10	9½	5 11 3		
		5	10	8	4 5 4		
		6	5	6¾	1 6 11		
Total .	...		. .	...	...	39 7 8	42 2 4
1849 ...	6	1	10	13¾	13 1 6		
		2	10	12¾	11 3 5		
		3	10	11½	9 2 2		
		4	10	10½	7 3 6		
		5	10	9½	5 11 3		
		6	10	8	4 5 4		
Total ...	..	.	...	..	...	51 3 2	50 5 0
1850	7	1	10	10½	7 7 10		
		2	10	9¾	6 7 2		
		3	10	9	5 7 6		
		4	10	8½	4 8 8		
		5	10	7½	3 7 9		
		6	10	6	2 6 0		
Total ..	...	.	.	. .	. .	30 6 11	31 4 9

Revised List of the remaining portions of the Specimens forwarded to Paris Exhibition, &c.—(*Continued*).

Year planted.	Specimen Number.	Section Number.	Length in Feet.	One-fourth Girth in Inches.	Contents of each Section.	Total Contents of each Tree.	Original Contents of each Tree as sent to Paris Exhibition.
1851	8	1	10	11½	9 2 2		
		2	10	10¼	7 3 6		
		3	10	9	5 7 6		
		4	10	8	4 5 4		
		5	11	6¾	3 5 9		
Total ..	...	...	.	..	...	30 0 3	30 3 7
1852	9	1	10	11½	9 2 2		
		2	10	10¾	8 0 3		
		3	10	9½	6 3 2		
		4	10	9	5 7 6		
		5	10	7	3 4 10		
Total	...	...	...	...	...	32 5 11	33 10 1
1853	10	1	10	10	6 11 4		
		2	10	9¼	5 11 3		
		3	10	8¼	4 8 8		
		4	11	7	3 8 11		
Total ...	...	...	...	...	...	21 4 2	21 9 7
1854	11	1	10	13½	12 2 3		
		2	10	12	10 0 0		
		3	10	11	8 4 10		
		4	10	10	6 4 11		
		5	10	9	5 7 6		
		6	10	8	4 5 4		
		7	10	6½	2 11 2		
Total ...	...	...	...	...	...	50 0 0	52 9 10
1855	12	1	10	9¼	5 11 3		
		2	10	8¼	4 8 8		
		3	10	7¼	3 7 9		
		4	12	6¼	3 3 0		
Total ...	...	...	...	...	...	17 6 8	17 6 2
1856	13	1	10	11	8 4 10		
		2	10	10¼	7 3 6		
		3	10	9¼	5 11 3		
		4	10	8½	5 0 2		
		5	13	7	3 4 10		
Total ...	...	...	...	...	...	30 0 7	31 2 6
1857	14	1	10	9½	6 3 2		
		2	10	8¼	4 8 8		
		3	10	7¼	3 7 9		
		4	10	6	2 6 0		
		5	10	4½	1 4 10		
Total ...	...	...	...	. .	...	18 6 5	19 6 4

Revised List of the remaining portions of the Specimens forwarded to Paris Exhibition, &c.—
(*Continued.*)

Year planted.	Specimen Number.	Section Number.	Length in Feet.	One-fourth Girth in Inches.	Contents of each Section.	Total Contents of each Tree.	Original Contents of each Tree as sent to Paris Exhibition.
1858	15	1	10	9¼	5 11 3		
		2	10	8½	5 0 2		
		3	10	7¾	4 2 0		
		4	10	7	3 4 10		
		5	10	6	2 6 0		
Total ...	...	...	...	...	...	21 0 3	20 10 3
1859	16	1	10	9	5 7 6		
		2	10	8¾	5 3 9		
		3	10	8	4 5 4		
		4	14	7¼	5 1 3		
Total .	.	...	...		...	20 5 10	22 0 11
1860	17	1	10	9½	6 3 2		
		2	10	8¾	5 3 9		
		3	10	8	4 5 4		
		4	16	7¼	3 4 10		
Total ...	...	..	...	...	..	19 5 1	18 10 10
1861	18	1	10	9½	6 3 2		
		2	10	8¾	5 3 9		
		3	10	7¾	4 2 0		
		4	10	6¼	3 1 11		
		5	6	6	1 6 0		
Total ..	.	...	...	...	...	20 4 10	20 5 4
1862	19	1	10	8½	5 0 2		
		2	10	7¾	4 2 0		
		3	10	7	3 4 10		
		4	10	6	2 6 0		
Total ...	...	. .	...	...		15 1 0	13 7 4
1863	20	1	10	9¼	5 11 3		
		2	10	8½	5 0 2		
		3	10	7¾	4 2 0		
		4	15	6	3 9 0		
Total ...		...	...	...	...	18 10 5	21 3 8
1864	21	1	10	9¼	5 11 3		
		2	10	8½	5 0 2		
		3	10	7¾	4 2 0		
		4	10	7	3 4 10		
		5	10	6¼	2 8 6		
		6	6	4¾	0 11 3		
Total ..	...	...	...	...	...	22 2 0	23 4 3

Revised List of the remaining portions of the Specimens forwarded to Paris Exhibition, &c — (*Continued*)

Year planted.	Specimen Number.	Section Number.	Length in Feet.	One-fourth Girth in Inches.	Contents of each Section.	Total Contents of each Tree.	Original Contents of each Tree as sent to Paris Exhibition.
1865	22	1	10	7½	3 10 10		
		2	10	7	3 4 10		
		3	10	6½	2 11 2		
		4	15	5	2 7 3		
Total ...	...	...	..	...	...	12 10 1	13 2 5
1866 ...	23	1	10	8	4 5 4		
		2	10	7½	3 7 9		
		3	10	6½	2 11 2		
		4	10	6	2 6 0		
		5	12	4¾	1 10 6		
Total ...	...	.	...	...	...	15 4 9	16 5 5
1867	24	1	10	8¼	4 8 8		
		2	10	7½	3 10 10		
		3	10	6¾	3 1 11		
		4	15	5¼	2 10 5		
Total ..	..	...	...	...	...	14 7 10	15 3 9
1868	25	1	10	7	3 4 10		
		2	10	6½	2 11 2		
		3	10	6	2 6 0		
		4	10	5½	2 1 2		
		5	6	4¾	0 11 3		
Total ...	. .	...	...	...	. .	11 10 5	12 5 8
1869	26	1	10	6	2 6 0		
		2	10	5½	2 1 2		
		3	12	4¾	1 10 6		
Total ...	...	...	..	.	..	6 5 8	6 1 6
Grand Total ...	...	...	...	...	...	816 7 2	839 3 5

NOTE.—The measurements for the Paris Exhibition were taken directly the trees were felled, the bark being full of sap, plump and fleshy, now the bark is dried up, therefore thinner and in some places eaten as well as the under side of the sap-wood by white ants.

MEMORANDUM showing Length of Boll, Quarter Girth, breast high and half length of five outside Trees of Plantation, 1844.

Number.	Length in Feet.	Breast high quarter Girth.	Half length quarter Girth.
1	66	15	11¼
2	70	17½	11¾
3	65	13¼	11¾
4	68	15¼	11½
5	57	20	15½
Total ...	...	81	61¾

Thus showing a difference of one-fourth part or 25 per cent. betwixt breast high and half length

MEMORANDUM showing five Trees in the Centre of the Plantation as above

Number	Length in Feet	Breast high quarter Girth	Half length quarter Girth
1	75	13	10¾
2	88	14¼	11½
3	69	13¼	11
4	67	13	11
5	75	14	10¾
Total		67¼	55

Showing a difference of fully one-sixth part or about 16⅔ per cent betwixt breast high and half length

Number	Length	Breast high	Half length
6	95	17¼	11 inches

Thus, last specimen showing a difference of fully ⅓ths or 40 per cent betwixt breast high and half length ¼ girths, was measured to the extreme limit of Boll, in the others 10 to 20 feet of secondary timber was excluded The five outside and in centre were taken in groups without selection

OOTACAMUND,
31st October 1878

(Signed) R H BEDDOME, Lieut -Colonel,
Conservator of Forests

ORDER THEREON, 18th November 1878, No. 1,845.

G O, 24th September 1877, No 2,846

IN accordance with the order noted in the margin, the Conservator of Forests has visited the Government Teak Plantations in Malabar and submits full details as to their extent, cost and present condition, with his views as to their future financial prospects. Colonel Beddome's inspection was very thorough, and his scrutiny of the past and probable expenditure and receipts very searching and complete; but the result is that he anticipates "an enormous yield and very large profits." This report is specially satisfactory as hitherto he has not (for reasons stated in paragraph 55) been sanguine as to the success of the enterprise.

2. *Extent and Condition.*—The Nelambur Forest Division is divided into fifteen blocks, and, according to survey measurements, their acreage is as follows :—

	ACRES.
Planted	3,435 98
Unplanted . .	15,433 71
Total .	18,869 69

The planted portion is further divided according to its anticipated yield as based on its present condition —

E G	ACRES
Full yield .	1,787 35
⅘ths	325 75
⅔ths	539 26
⅓ths ..	273 78
Nil ...	509 84
Total •	3,435 98

Thus on "509 acres or more than ¼th of the whole" planted portion the growth is so poor that the Conservator thinks it safest to enter the anticipated yield as "Nil," though he considers "there is much that might be classed as ¼th."

3. *Financial position.*—The following abstract statement exhibits the charges and receipts for the whole division from 1840-41 to 1877-78:—

Charges.	Rs.	A.	P.	Receipts.	Rs.	A.	P.
Acquisition of land, &c.	1,00,840	5	11	Timber	1,57,798	7	2
Establishment ...	1,47,635	1	11	Bamboos	10,755	9	8
Charges on timber .	45,114	12	5	Saplings	1,29,312	13	6
Plantation charges	1,51,896	14	6	Miscellaneous	2,535	13	1
Floating operations	31,908	3	2				
Total	4,77,395	5	11	Total ..	3,00,402	11	5

The Board of Revenue having supplemented the Conservator's figures with details furnished by the Collector calculate the total debt of the plantations, "accumulated at 4 per cent. compound interest, at Rupees 3,77,827."

4. *Future prospects.*—To estimate the future return from the plantation it is necessary to determine the age at which the trees will arrive at maturity, the number and cubical contents per acre, and the price the timber will fetch.

(a.) Age of maturity.—Colonel Beddome believes that the trees in the plantations will grow and develope more rapidly than those in the natural forests, and as these are found to be mature at about sixty years, this may safely be taken as the age of maturity.

(b.) Cubical contents.—For the first thirty years of their life the upward growth of the trees is encouraged, but as the numbers originally planted become much thinned out and air and light are admitted, and there is more space, this tendency is somewhat checked, and the growth in girth takes its place. Some of the trees in the older plantations already contain 100 cubic feet of timber so that this amount may safely be taken as the average cubical contents of the trees of which sixty per acre are to be left to mature.

(c.) Prices the timber will fetch.—As the first regular felling of mature timber cannot take place until the year 1904, it is impossible to estimate the prices that will then prevail. The market depôt will be at Calicut, to which the timber can be transported from the plantations at a cost of 3 to 5 Annas a cubic foot. The prices now range at that place from Rs. 1-8-0 to 2 Rs. per cubic foot, so that the Conservator's estimate of a net profit of 10 Annas per cubic feet is exceedingly moderate.

5. From the foregoing data it is assumed that from the 2,484⅔ acres which are expected to yield a full crop, 14,906,108 cubic feet of timber will be harvested, realizing Rs. 90,00,000.

6. It is stated that Teak trees may be allowed to stand for fifty years after maturity, and that thus felling on the existing plantations need not close until the year 1986, and will thus be spread over a period of eighty-two years. This makes the average yearly profit Rs. 1,14,375, and the Board calculate that this sum, accumulated until the above date with interest at 4 per cent., will amount to Rs. 684,26,780 against a debt of Rs. 261,14,960 similarly calculated.

7. *Extension of planting.*—Colonel Beddome concludes his report with discussing the question of the extension of planting operations. Land is available, though much of this for different reasons he considers it inadvisable to plant. He would not, it seems, enlarge the planted area until the year 1900, though he would apparently commence to raise a second crop on some of the land already occupied when the trees on it are reduced to their final number of sixty per acre.

The Board of Revenue point out that it will not be necessary as far as the timber is concerned to spread felling over so long a period as eighty-two years, and that if it is to be carried out more expeditiously it may be advisable to undertake further planting.

The question is one of great difficulty, and time and further discussion are in the opinion of Government necessary to its decision. At present the Conservator states there would not be a market at Calicut for an annual harvest of Teak of the extent expected, and some experience as to the quality of the timber seems necessary.

8. Of the other matters touched on by the Conservator in his report, some are already before Government, and the others should be separately reported for their orders.

9. The specimens of the Teak saplings have now been received from the Conservator, and will be forwarded to the Secretary of State.

(True Extract.)

(Signed) L. A. CAMPBELL,
Under Secretary to Government.